# DENON

Hi-Fi Component

# SERVICE MANUAL

## STEREO CD PLAYER

## MODEL DCD-1420

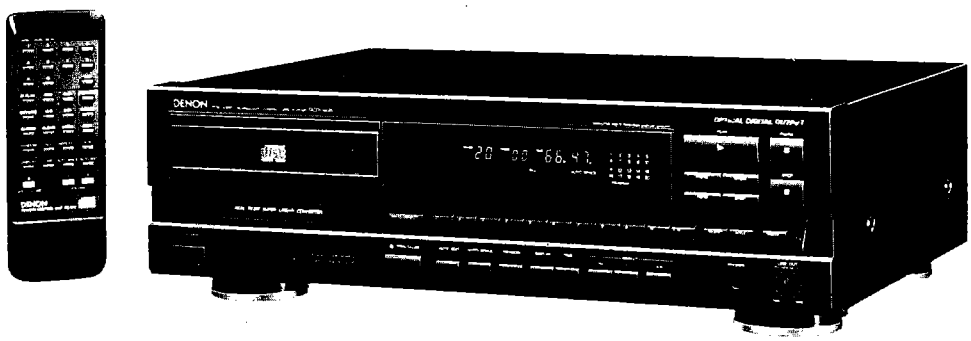


TABLE OF CONTENTS


OPERATING INSTRUCTIONS . . . . . 2 ~ 11
NOTE FOR HANDRING OF LASER PIC-UP . . . . . 12 ~ 14
DISASSEMBLY . . . . . 15
ADJUSTMENT . . . . . 16 ~ 22
HEAT RUN MODE FUNCTION . . . . . 23
IC TERMINAL FUNCTION . . . . . 24 ~ 29
PARTS LIST OF P.W.BOARD . . . . . 30 ~ 31
PARTS LIST OF EXPLODED VIEW . . . . . 32
EXPLODED VIEW . . . . . 33
PARTS LIST OF PACKING & ACCESSORIES . . . . . 34
PARTS LIST OF FG-402 MECHANISM UNIT . . . . . 34
EXPLODED VIEW OF FG-402 MECHANISM UNIT . . . . . 34
WIRING DIAGRAM . . . . . 35
P.W. BOARD . . . . . 36 ~ 37
SEMICONDUCTORS . . . . . 38
SCHEMATIC DIAGRAM . . . . . 39



NIPPON COLUMBIA CO., LTD.

## IMPORTANT TO SAFETY

**WARNING:**
**TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.**

## CAUTION:

1. **Handle the power supply cord carefully**
   Do not damage or deform the power supply cord. If it is damaged or deformed, it may cause electric shock or malfunction when used. When removing from wall outlet, be sure to remove by holding the plug attachment and not by pulling the cord.
2. **Do not open the top cover**
   In order to prevent electric shock, do not open the top cover. If problems occur, contact your DENON dealer.
3. **Do not place anything inside**
   Do not place metal objects or spill liquid inside the CD player. Electric shock or malfunction may result.

Please, record and retain the Model name and serial number of your set shown on the rating label.
Model No. DCD-1420 Serial No. _____

**IMPORTANT**
(BRITISH MODEL ONLY)

The wires in this mains lead are coloured in accordance with the following code:

| | |
|---|---|
| Blue: | Neutral |
| Brown: | Live |

The colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows.
The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.
The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

**NOTE:** **This CD player uses the semiconductor laser. To allow you to enjoy music at a stable operation, it is recommended to use this in a room of 5°C – 35°C.**

## SAFETY INSTRUCTIONS FOR AUDIO SET

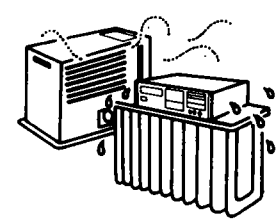
### ■ INSTALLATION

1. Operate the set only from a power source which is indicated on the rating label (indication) at the back of the set.
2. Frayed cords and broken plugs may cause a fire or shock hazard. Do not damage the power cord.
   - Do not cut and splice the power cord.
   - When removing the power cord from wall outlet, be sure to unplug by holding the plug attachment and not by pulling the cord. Do not hold the plug with wet hands.
   - Call your service technician for replacement of damaged cords and plugs.
3. Select a place so that the location or position does not interfere with the proper ventilation of the set for releasing heat generated during operation.
   - Select a flat and level surface allowing enough space for setting up and operation.
   - Never block the bottom ventilation holes placing the set on a bed, sofa, rug, etc.
   - Never place the set in a "built-in" enclosure unless proper ventilation is provided.
   - Never place the set near or over a radiator, heat register or stove.
   - Avoid locations where the set is exposed directly to the sun light.

Check voltage.

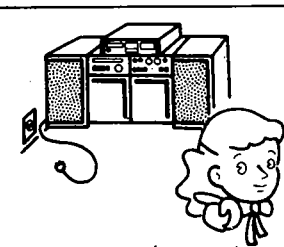
Do not pinch power cord.

Do not splice power cord.


Avoid heat.

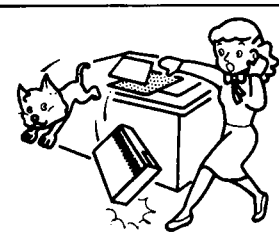
### ■ USE

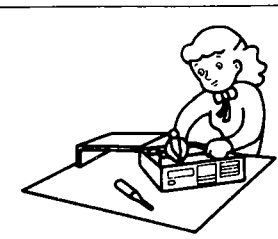
1. Do not expose the set to rain or water (liquid). Do not spill liquid or insert metal objects inside the set. Rain, water or liquid such as cosmetics as well as metal may cause electric shorts which can result in fire or shock hazard. If anything gets inside, unplug the power cord and have a DENON service technician check your set before further use.
2. Never leave your set switched on when leaving the house. For added protection of your audio system during lightning storm or when the set is to be left unused for a long period of time, be sure to unplug the power cord from the wall outlet.
3. Take care so that the set is not dropped to avoid damaging the cabinet which defeats safeguards or injuring yourself. If the set has been dropped or the cabinet has been damaged, unplug the set and have it checked by a DENON service technician to restore the safeguards.


Remove power in your absence.

### ■ SERVICING

1. The servicing of the set must not be attempted by yourself beyond that described in the operating instructions. In case of problems that cannot be settled by referring to your operating instructions, unplug the power cord and contact your DENON dealer. No user-serviceable parts are inside the set. Only qualified service technician can service inside your set.
2. Refer to the operating instructions for maintenance and


Do not drop.


No user-serviceable parts inside.

Thank you for purchasing this DENON Compact Disc Player. Please read the operating instructions thoroughly in order to acquaint yourself with the CD player and achieve maximum satisfaction from it.

## — TABLE OF CONTENTS —


FEATURES ..... 3
NAMES AND FUNCTIONS OF PARTS ..... 4 ~ 5
CONNECTION ..... 6
OPENING AND CLOSING THE DISC HOLDER AND LOADING A DISC ..... 6
NORMAL CD PLAYBACK ..... 6
ADVANCED CD PLAYBACK ..... 7 ~ 9
TIMER-CONTROLLED PLAYBACK ..... 9
THE COMPACT DISC ..... 10
INSTALLATION PRECAUTIONS ..... 10
PLAYBACK USING THE REMOTE CONTROL UNIT ..... 10 ~ 11
TROUBLESHOOTING ..... 11
SPECIFICATIONS ..... 11


**Please check to make sure the following items are included with the main unit in the carton:**

(1) Operating Instructions ..... 1
(2) Connection Cord ..... 1
(3) Remote Control Unit RC-217 ..... 1

**VAROITUS:** **SUOJAKOTELOA EI SAA AVATA. LAITE SISÄLTÄÄ LASERDIODIN, JOKA LÄHETTÄÄ NÄKYMÄTÖNTÄ SILMILLE VARRALLISTA LASERSÄTEILYÄ.**

**ADVARSEL:** **USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSAETTELSE FOR STRÅLING.**

**VARNING:** **OSYNLIG LASERSTRÅLNING VID AVLÄGSNANDE AV APPARATENS HÖLJE. UNDVIK EXPONERING AV LASERSTRÅLNING.**

"CLASS 1
LASER PRODUCT"

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital appratus setout in the Radio Interference Regulations of the Canadian Department of Communication.

Le présent appareil numérique n'émet pas de bruites radioélectriques dépassant les limites applicables aux appareils numériques de la Class B prescrites dans le Réglement sur le brouillage redioélectrique édicté par le ministére des Communications du Canada.

## FEATURES

The DCD-1420 Compact Disc Player incorporates DENON's Super Linear Converter which prevents deterioration of sound quality in PCM playback systems. This assures accurate reproduction of the digital signals recorded on compact discs no matter whether they are pure studio recordings or "live" performance recordings. All parts making up this CD player have selected with the greatest care in order to produce high quality realistic playback of the full musical content on compact discs.

**(1) Real 20-bit Double Super Linear Converter**
The use of Denon's unique system and D/A converters with excellent resolution to prevent zero cross distortion, the main cause of reduced sound quality in the PCM playback system, makes for sound field reproduction with rich musical expression.

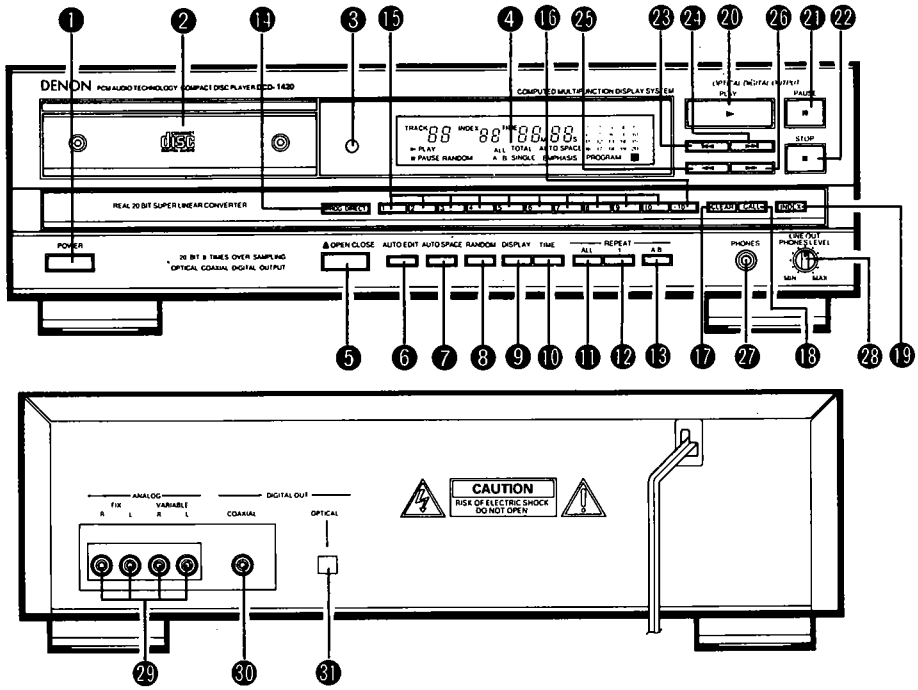
**(2) High Performance Digital Filter**
The DCD-1420 uses independent real 20-bit D/A converters for the left and right channels and an 8× oversampling high precision digital filter to bring out the best of the analog filter and offer clear, crisp sound.

**(3) Remote Control Including Volume Control**
Aside from such functions as play, pause, stop and direct search using the number buttons, the remote control unit also offers volume control using the "+" and "–" buttons. The remote control functions greatly enhance operability of the DCD-1420.

**(4) Optical Digital Output**
The information on the compact disc can be output in digital format to an external digital processor or D/A unit for playback.
Aside from the coaxial output, the DCD-1420 also includes an optical output, thereby improving sound quality and eliminating noise interference.

**(5) Simple Playback of 8 cm CD Singles**
8 cm CD signals can be played without using an adaptor.

## NAMES AND FUNCTIONS OF PARTS




### ❶ Power Switch (POWER)

- When the power is turned on, "(00)" appears on the second portion on the TRACK NO. display, and if no disc is loaded, "(00:00:00)" appears on the digital display and the calendar lights after a few seconds.
- If the power is turned on with a disc already loaded, the total number of tracks on the disc is displayed on the TRACK NO. display, the total time is displayed on the TIME display, the numbers on the music calendar light up to the number of tracks on the disc, and playback begins.

### ❷ Disc Holder

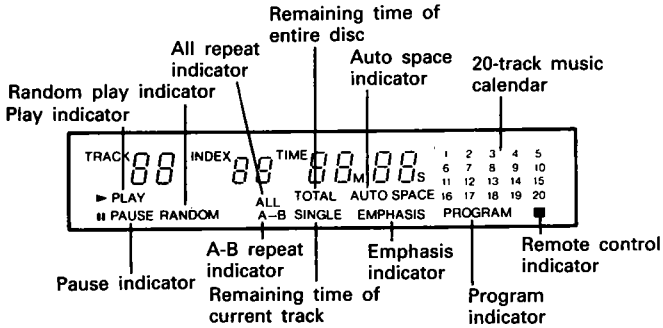
- Place the disc on the disc holder with the label facing up.
- Use the open/close button ( ⏏ OPEN/CLOSE) ❺ to open and close the disc holder.
- The disc holder may also be closed by pressing the play button ( ▶ PLAY) ⓴ or pause button ( ⏸ PAUSE) ㉑.

### ❸ Remote Control Sensor

- This sensor receives the infrared light transmitted from the wireless remote control unit.
- For remote control, point the supplied remote control unit RC-217 towards this sensor.
- When a signal is transmitted from the remote control unit, the remote control indicator in the display ❹ will light up briefly.

### ❹ Display

- The digital display is divided into sections, such as displays for track number, index, playback time and calendar, as shown below.




### ❺ Open/Close Button ( ⏏ OPEN/CLOSE)

- The disc holder is opened and closed by pressing this button.
- Press this button once to open the disc holder, and once again to close it.
- When the disc holder is closed with a disc loaded, the disc will rotate for a couple of seconds while the disc contents are read. The number of tracks and total playback time on the disc are then displayed on the digital display ❹.

### ❻ Auto Edit Button (AUTO EDIT)

- The tracks on the CD are automatically split into two halves, Side A and Side B, like an analog disc, with the division at the place between tracks which is closest to 1/2 the total playing time.
- When this button is pressed in the stop mode, the total playing time for the first half and the track numbers on the calendar are displayed for approximately 2 seconds. Next, the same is done for the second half, after which the unit is automatically set to the pause mode at the beginning of the first track. When the PLAY or PAUSE button is pressed, playback begins, and the unit is automatically set to the pause mode at the beginning of the first track of the second half which was previously displayed. When the PLAY or PAUSE button is pressed again, playback resumes, and the unit is automatically set to the stop mode at the end of the last track on the disc.
- This function will only work for discs with a total of 20 tracks or less. Also, when this function is used the mode is automatically set to the program mode, so direct search is not possible.
- The auto edit function is cleared when the OPEN/CLOSE, STOP or PROG/DIRECT button is pressed.
- The data for the total playing time recorded on the disc and the actual total playing time of the tracks differ, so there may be a difference between the time displayed in the stop mode (the total playing time) and the total of the times of the first and second halves in the auto edit mode (about 2 seconds).

### ❼ Auto Space Button (AUTO SPACE)

- Pressing this button will cause the [AUTO SPACE] indicator to light and a blank space of approximately 4 seconds is inserted between tracks during CD playback. Pressing the button once more, the [AUTO SPACE] indicator goes out and the Auto Space feature is cancelled.
- When one of the track search buttons ( ⏮ or ⏭ ) is pressed, the Auto Space function will not operate.
- The Auto Space function will work during normal playback as well as programmed playback.
- Although 4-second blanks are inserted between tracks, this additional time is not reflected by the indication on the time remaining display or time display when the Auto Edit function is engaged.

### ⑧ Random Play Button (RANDOM)
- Press this button to play the tracks on the disc in random order.

### ⑨ Display Button (DISPLAY)
- Press this button to turn the indicators on the display window off.
- When pressed once, only the track number, index number, and time will remain lit.
- When pressed again, all indicators are turned off, and only the track number will be displayed except during playback.

### ⑩ Time Mode Button (TIME)
- This button is used to select the desired indication on the TIME display. The indication on this display will change each time the button is pressed.
  Normally, the elapsed playback time of the current track is displayed.
  Pressing the button once, [SINGLE] is displayed and the remaining time of the current track is displayed.
  Pressing once more, [TOTAL] is displayed, and total playing time of remaining tracks is displayed. However, when programmed play is in progress, the total remaining time of the program is displayed.
  Press the button once again to return to the normal display of the elapsed playback time of the current track.

### ⑪ Repeat All Tracks Button (ALL)
- Press this button to repeat playback of all tracks.
- When this button is pressed, [ALL] lights on the display and all tracks on the disc or in a program will be repeatedly played back. Press this button once more to disengage the Repeat All function.

### ⑫ 1-track Repeat Button (1)
- Press this button to repeat one track only.
  When pressed during playback, the track currently playing is repeated.

### ⑬ A-B Repeat Button (A – B)
- Press this button for repeat playback between a designated starting point (A) and an ending point (B). (Refer to page 8 for details.)

### ⑭ Program/Direct Button (PROG/DIRECT)
- Press this button when you want to enter tracks for programmed playback. (Refer to page 7 for details.)

### ⑮ Number Buttons (1, 2, 3, 4, 5, 6, 7, 8, 9 and 10)
- Use these buttons for the direct search and program memory functions.
  For direct search, press for example button [3] if you want to hear track number 3. For track number 12, press [+10] then [2].
  To program tracks, press the PROG/DIRECT button to set to the program mode.

### ⑯ +10 Button (+10)
- Press this button first when selecting track numbers over 10. Use it together with the number buttons. For example, to select track number ⑮, press [+10] then [5].
  For track number 33, press [+10] three times, then press [3].

### ⑰ Clear Button (CLEAR)
- Use this to correct programmed tracks. (Refer to Page 7)

### ⑱ Call Button (CALL)
- Press this button to check the tracks which have been programmed.

### ⑲ Index Button (INDEX)
- Press this button to start playback from an index within a track. Use the number buttons to specify the index number.

### ⑳ Play Button ( ▶ PLAY)
- Press this button to start playback of a disc.
- When this button is pressed, [▶ PLAY] is displayed, and the track number being played is displayed together with the elapsed playback time of the track.
- Tracks are shown on the calendar display. Once a track has been played, the corresponding track number goes out on the

### ㉑ Pause Button ( II PAUSE)
- Press this button to stop playback temporarily.
- If this button is pressed during playback, playback is stopped temporarily, the [▶ PLAY] indicator goes out and the [II PAUSE] indicator lights.
- Press this button or the play button ( ▶ PLAY) again to continue playback.

### ㉒ Stop Button ( ■ STOP)
- Press this button to stop playback.
  The disc will stop rotating, and the number of tracks and total playing time of the disc are displayed on the TRACK NO. and TIME displays, respectively.
- In case programmed playback is engaged when this button is pressed, the number of tracks and total playing time of the program are displayed.
- If this button is pressed in the stop mode, the program memory is cleared.

### ㉓ Automatic Search Reverse Button ( ⏮ )
- Press this button to return the pickup to the beginning of the present track. Press again to return to other tracks.
- By pressing the button a number of times, the pickup will move back the corresponding number of tracks.

### ㉔ Automatic Search Forward Button ( ⏭ )
- Press this button to move the pickup forward to the beginning of the next track. Press again to move ahead to other tracks.
- By pressing the button a number of times, the pickup will advance the corresponding number of tracks.

### ㉕ Manual Search Reverse Button ( ◀◀ )
- Press this button during playback for fast reverse search. As long as the button is kept pressed, music signals are played back faster than normal.
- Pressing this button when the pause mode is engaged, you can quickly reverse the pickup to a desired position, three times faster compared to manual reverse search during playback. During this time, no sound is heard.

### ㉖ Manual Search Forward Button ( ▶▶ )
- Press this button during playback for fast forward search. As long as the button is kept pressed, music signals are played back faster than normal.
- Pressing this button when the pause mode is engaged, you can quickly forward the pickup to a desired position, three times faster compared to manual forward search during playback. During this time, no sound is heard.

### ㉗ Headphones Jack (PHONES)
- For private listening, you can connect your headphones to this jack. Do not raise the volume level too much when listening through headphones. (Headphones are sold separately.)

### ㉘ Volume Control (LINE OUT/PHONES LEVEL)
- Use this to adjust the output level (VOLUME) of the headphones or line output (VARIABLE).
- The same operation is possible using the included remote control unit. (See Page 11)

### ㉙ Output Terminal (FIX-VARIABLE)
- Connect these jacks to the input jacks on your amplifier. (Refer to page 6 for details on the connections.)

### ㉚ Digital Output Jack (COAXIAL)
- This jack outputs digital data.
- We recommend using a 75-ohm pin cord (available in stores) for connections.

### ㉛ Digital Output Jack (OPTICAL)
- Outputs digital optically.

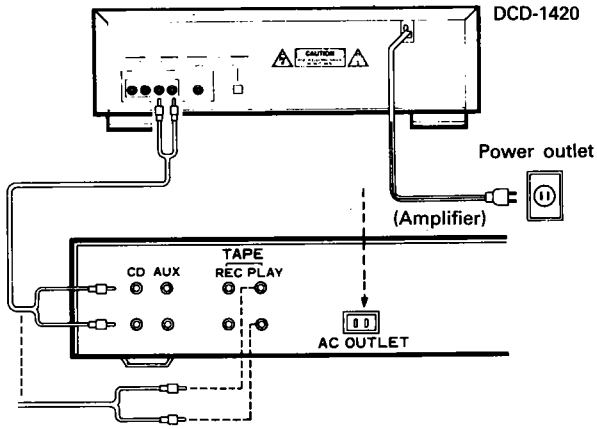
**Continuous Operation**
If the automatic search reverse button ㉓, the automatic search forward button ㉔, the CALL button ⑱, or the +10 button ⑯ are held in, the function of that button will be repeated.

## CONNECTION

**(1) Connecting the Output Terminal (FIX-VARIABLE)**

Use the included pin cords to connect the left (L) and right (R) output terminal (FIX-VARIABLE) of the DCD-1420 to the CD, AUX, or TAPE PLAY left (L) and right (R) input jacks of the amplifier.

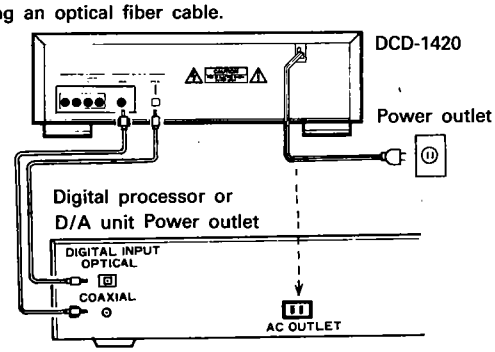
There are two types of output jacks, one of the variable type and one of the fixed type. Be sure to use the variable outputs if you want to be able to control the output level from the DCD-1420.




**(2) Connecting the Digital Output Jack (COAXIAL/OPTICAL)**

Use a 75-ohm pin cord to connect the digital output jack (COAXIAL) of the DCD-1420 to the digital input jack (COAXIAL) on a digital processor or D/A unit, available in stores.

In the same way, connect the digital output jack (OPTICAL) on the DCD-1420 with the optical input on a digital processor or D/A unit using an optical fiber cable.




**Connection Precautions**

- Before proceeding with connections or disconnections of cables and power cords, be sure to turn all system components off.
- Ensure that all cables are connected properly to the L (left) and R (right) jacks.
- Insert plugs fully into the terminals.
- Connect the output jacks to the amplifier CD, AUX or TAPE PLAY input jacks.

## OPENING AND CLOSING THE DISC HOLDER AND LOADING A DISC

**Opening and closing the disc holder** (This operation only works while the power is on.)

1. Press the power switch (POWER) to turn on the power.
2. Press the open/close button ( ≜ OPEN/CLOSE).

**How to load a disc**

- Make sure the disc holder is completely open.
- Hold the disc by the edges and place it on the disc tray. (Do not touch the signal surface, i.e., the glossy side.)
- When using 12 cm. diameter discs, make sure the outer edge matches the tray guide circumference (Fig. 1), and when using CD singles (8 cm. diameter) match the outer edge with the inner tray guide circumference. (Fig. 2)
- Press the open/close button ( ≜ OPEN/CLOSE) to close the disc holder.
- When the disc holder is closed, the disc is read and after a few seconds the number of tracks and total playing time are displayed on the TRACK NO. and TIME displays, respectively.
- When the disc holder is open and a disc is loaded, you may also press the play ( ▶ PLAY) or pause ( II PAUSE) button to close the disc holder. (If the play button ( ▶ PLAY) is pressed, playback will start immediately

**Fig. 1**

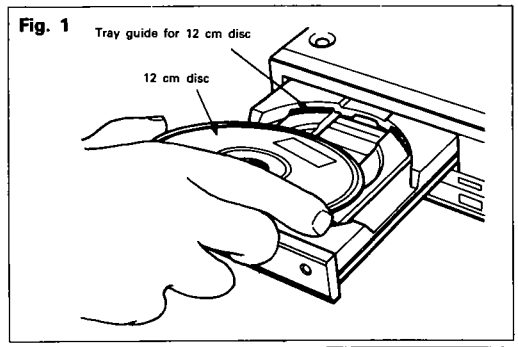
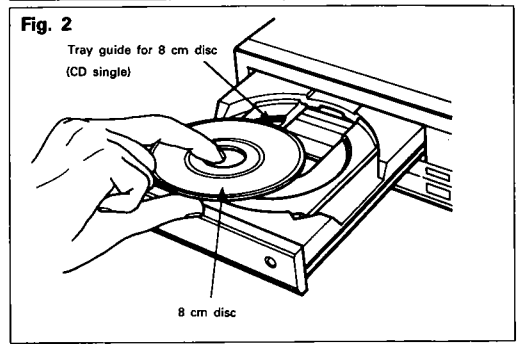



**Fig. 2**

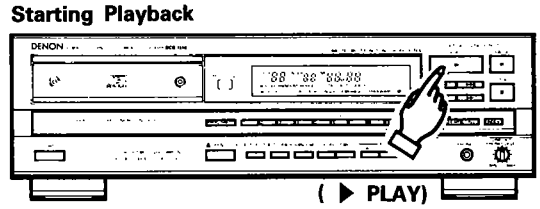



**Caution:**

- If your finger should get caught in the disc holder when it closes, press the open/close button ( ≜ OPEN/CLOSE).
- Do not place any foreign objects on the disc tray, and do not place more than one disc on the tray at a time. Otherwise malfunction may occur.
- Do not push in the disc tray manually when the power is off as this may cause malfunction and damage the CD player.

## NORMAL CD PLAYBACK

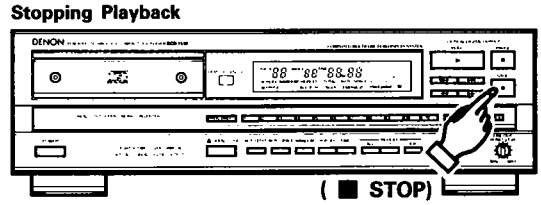
**(1) Starting Playback**




1 Press the power switch (POWER) to turn on the power.
2 Load the disc you want to play.
- When the disc holder is closed, the disc is read and the number of tracks and total playing time of the disc are displayed.

3 Press the play button ( ▶ PLAY).

**(2) Stopping Playback**

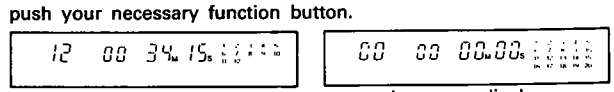



1 Press the stop button ( ■ STOP).
- When all tracks have been played on a disc, playback will stop by itself.

**Precautions:**

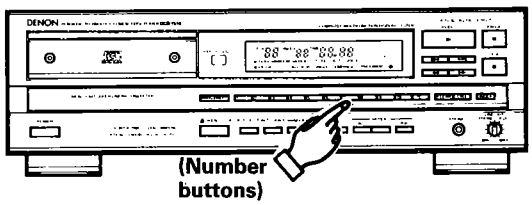
- If no disc has been loaded or the disc has been placed upside down, all indicators will light.
- When the information on the disc cannot be read correctly, for example due to dust or dirt on the disc, the indicators will read as shown below. Nothing will be shown on the TRACK NO. and TIME displays, and it may take quite a while to read the disc.
- When PLAY, PAUSE or NUMBER buttons are pushed just after turning on the unit with a disc inserted, the "TRACK INDEX TIME M S" display might not be indicated in the window. This is normal.

In this case, push the STOP button to light-up the display and then, push your necessary function button.



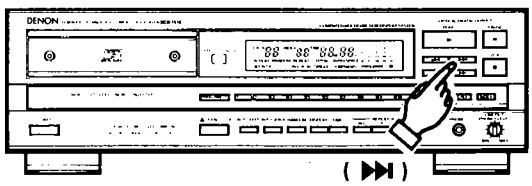
# ADVANCED CD PLAYBACK

**❶ Playing a Specific Track Direct Search ..... Number buttons**




- Use the number buttons and the +10 button to input the number of the desired track.
  For example, to play track number 4, press [4], and to play track number 12, press [+10] and [2]. Playback will begin from that track.

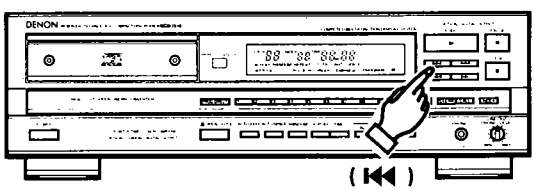
**❷ Advancing to the next track during playback ..... Automatic Search**




Press the Automatic search forward button ( ▶▶| ) during playback.

- The pickup will advance to the beginning of the next track and playback will continue. Pressing the button several times will forward the pickup the corresponding number tracks.

**❸ Returning to the beginning of the current track during playback ..... Automatic Search**

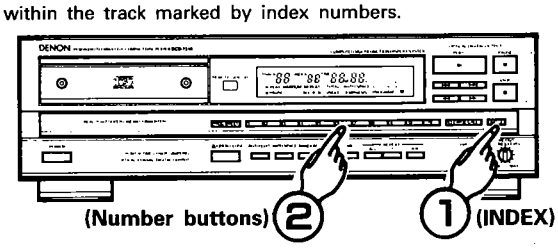



Press the Automatic search reverse button ( |◀◀ ) during playback.

- The pickup will return to the beginning of the current track and playback will continue. Pressing the button several times will return the pickup the corresponding number tracks.

**❹ Finding Sections Within a Track ..... Index Search**

- With this function, you can find and play from the beginning of sections within the track marked by index numbers.



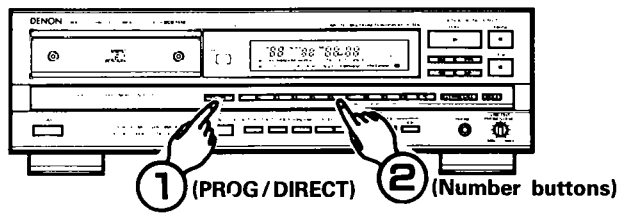

① "--" appears on the TRACK NO. display when the INDEX button is pressed.
② Input the track number using the number buttons.
Next, "--" appears on the INDEX display. Input the desired index number, and playback will start from that index number.
For example, to start from index 2 on track number 3, press INDEX, 3, then 2.

**Indexes**
- Indexes are numbers which are assigned to sections within a track. Check the disc's explanatory notes for the index numbers.
- If you input an index number not on the disc, playback will start from the last index number on the track.

**❺ Playing Specific Tracks in a Specific Order ..... Programmed Play**

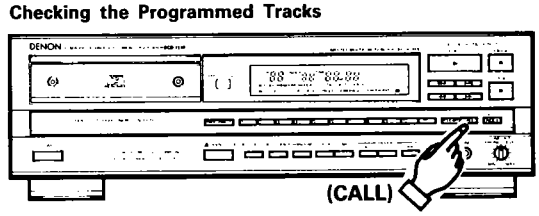
- With this function, you can choose any of the tracks on the disc and program them to play in any order.
- Programming is possible with the disc holder open.
- Up to 20 tracks can be programmed.
- The programmed tracks are shown on the calendar.

**(1) Programming**



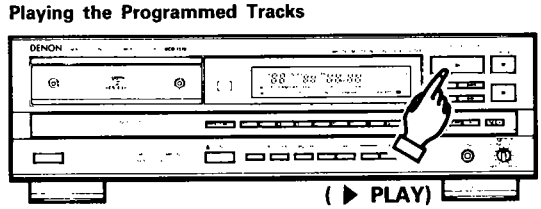

- Press the PROG/DIRECT button so that the [PROGRAM] indicator lights, then use the number buttons and the +10 button to program the tracks.
  For example, to program tracks 3, 12, and 7, press [PROG/DIRECT], [3], [+10], [2], and [7].
  The corresponding track number lights on the calendar each time a track is programmed, the track number is displayed on the TRACK NO. display, the number of tracks programmed is displayed on the INDEX display, and the total playing time of the programmed tracks is displayed on the TIME display. A few seconds after the last track has been programmed, the total number of tracks programmed is displayed on the TRACK NO. display and the total playing time of the programmed tracks is displayed on the TIME display.

**(2) Checking the Programmed Tracks**



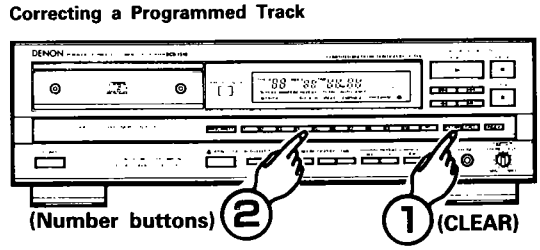

- Press the CALL button.
  The programmed tracks are displayed in order on the TRACK NO. display each time the CALL button is pressed.

**(3) Playing the Programmed Tracks**




- Press the ( ▶ PLAY) button to play the tracks in the programmed order.

**(4) Correcting a Programmed Track**




- To correct the last track which ahs been programmed, press the CLEAR button then progam the track correcity.
- To clear a track in the middele of the program, press the CALL button to recall the track, then press CLEAR button, and finally press STOP button.

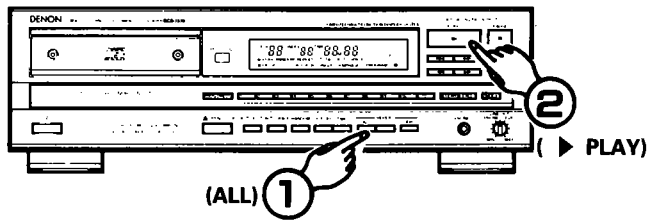
### (5) Clearing the Program

- The entire program is cleared when the PROG/DIRECT button is pressed again. The program is also cleared when the ( ⏏ OPEN/CLOSE) button is pressed.
- If the PROG/DIRECT button is pressed during programmed play, the program is cleared and playback continues normally through to the last track on the disc.

**NOTES**

- If programming is done in the play or pause mode, the track currently playing is programmed at the first position. Other tracks can be added to the program, but the number of programmed tracks and the playing time will not be displayed.
- Direct search is not possible during programmed play. If the number buttons are pressed, that track is added to the end of the program.
- Programming is possible with the disc holder open. Track numbers greater than the number of tracks recorded on the disc can be programmed, but will be automatically cleared before playback begins.
- The remaining time per track will only be displayed for track numbers 1 through 20.
- The total program time and remaining program time are not displayed if tracks greater than track number 20 are programmed.

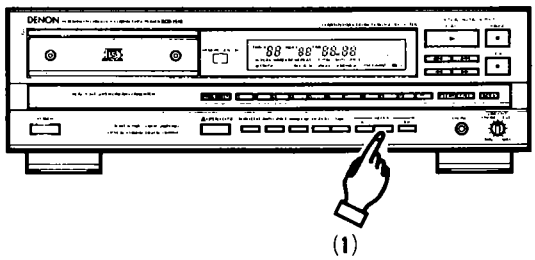
### ❻ Repeating playback of all tracks ..... Repeat All



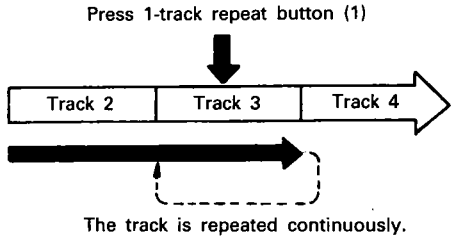

① Press the repeat all button (ALL).
② Press the play button ( ▶ PLAY).

- Pressing the repeat all tracks button (ALL), ALL is displayed.
- Steps ① and ② above may be reversed.
- To cancel repeat playback of all tracks, press the repeat all button (ALL) once more.
- Pressing the repeat all button (ALL) during programmed playback, playback of the tracks entered into the memory will be repeated.

### ❼ Repeating a Single Track ..... 1-track Repeat




- Press this button if you want to hear a track repeatedly.

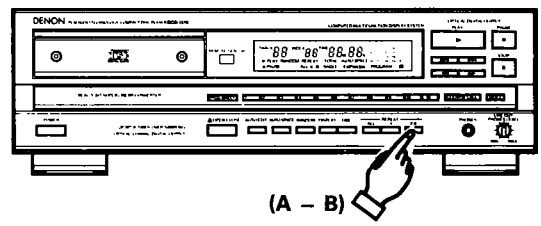



- When the 1-track repeat button (1) is pressed during playback, only the number of the track currently playing will remain lit on the calendar, as long as the track number is not over 20, and that track will be repeated.
- If the track number is 21 or over, the 1-track repeat function will work, but nothing will be lit on the calendar.
- When the 1-track repeat button (1) is pressed in the stop mode, track number 1 lights on the calendar and the 1 track repeat function is possible. To start, press the ( ▶ PLAY) button.
- To cancel 1-track repeat, press the 1-track repeat button (1) once again. Normal playback will resume.

**NOTE:**

1-track repeat is possible during the all track repeat function (when the ALL indicator is on) by pressing the 1-track repeat button (1). When this is done, the ALL indicator will remain lit, and the all track repeat mode will resume when the 1-track repeat button (1) is pressed again.

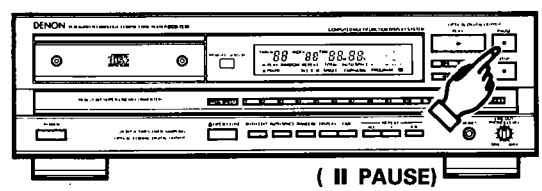
### ❽ Repeating playback of a desired interval ..... A-B Repeat




1. Start playback and press the A-B button when you reach the starting point of the interval. The A-B indicator starts blinking.
2. Continue playback or advance the pickup using the Automatic search forward button ( ▶▶| ) or manual search forward button ( ▶▶ ) until the ending point is reached. Then press the A-B button once more. The A-B indicator will light.

- The pickup will now return to the starting point and repeat playback of the selected interval.
- This interval will be repeated until the A-B repeat mode is cancelled by pressing the A-B repeat button. The A-B indicator goes out.
- A-B repeat playback is not possible during programmed playback.

### ❾ Pausing playback at any point ..... Pause



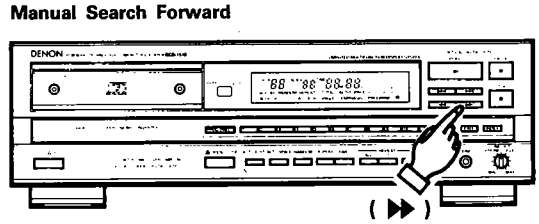

- Playback can be temporarily halted and then continued from the same point in the track.

1. Press the pause button ( II PAUSE) during playback.
2. To continue playback, press the play button ( ▶ PLAY) or the pause button ( II PAUSE) once more.

### ❿ Audible quick search ..... Manual Search

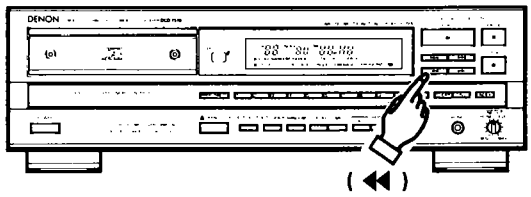
- Using this function, you can cue to a desired point within a track, either in the forward or reverse direction.
- Release the manual search button ( ◀◀ or ▶▶ ) when the desired point has been reached. Normal playback then continues.

#### (1) Manual Search Forward



1. Press the manual search forward button ( ▶▶ ) during playback. Playback of the track is sped up.
- As a reference, the current track number and elapsed playback time within the track are displayed.
- Manual search forward is approximately three times faster when engaged during the pause state compared to playback. In this case, no sound is heard however.
- If the manual search forward button ( ▶▶ ) is kept pressed after the end of the final track on the disc is reached, (--) is displayed and manual search stops. To return to another point, press the manual search reverse button ( ◀◀ ) until (--) disappears.

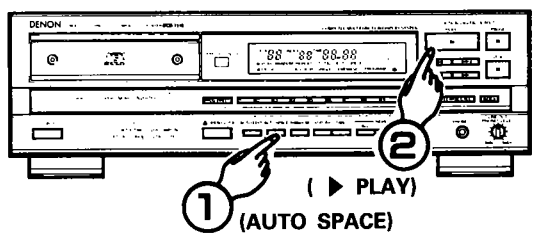
**(2) Manual Search in Reverse**




1. Press the manual search reverse button ( ◀◀ ) during playback. Reverse playback of the track is sped up.
- As a reference, the current track number and elapsed playback time within the track are displayed.
- Manual search in reverse is approximately three times faster when engaged during the pause state compared to playback. In this case, no sound is heard however.
- If the manual search reverse button ( ◀◀ ) is kept pressed after the beginning of the first track on the disc is reached, (--) is displayed and manual search stops. To return to another point, press the manual search forward button ( ▶▶ ) until (--) disappears.

**⓫ Inserting blanks between tracks ..... Auto Space**

- This is convenient feature that will insert 4-second blanks between tracks, which can be used when recording compact discs on tape.

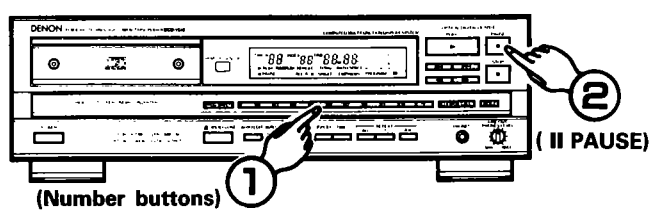



1. Pressing the auto space button (AUTO SPACE) will cause the AUTO SPACE indicator to light.
2. Press the play button ( ▶ PLAY) to start playback. When a track has been played to its end, a 4-second silence is made before the next track starts playing.
3. Press the auto space button (AUTO SPACE) again to cancel the function.

**⓬ Searching and Pausing at the Beginning of the Track ..... Pause**

**(1) With Direct Search**

- In this case, the set pauses at the beginning of the track found with the direct search operation.



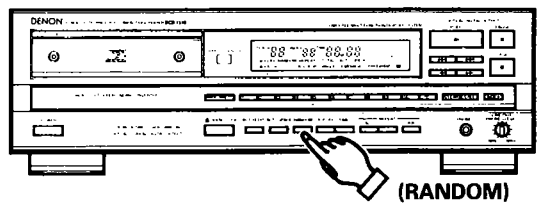

1 Press the number button(s) for the desired track.
2 Press the ( II PAUSE) button.
- To start playback, press the ( ▶ PLAY) or ( II PAUSE) button.

**(2) With Program Search**

- Press the ( II PAUSE) button after the program search operation is completed. The set will pause at the beginning of the first programmed track.

**⓭ Playing in Random Order ..... Random Play**

- With this function, the tracks recorded on the disc can be played in a completely random order.



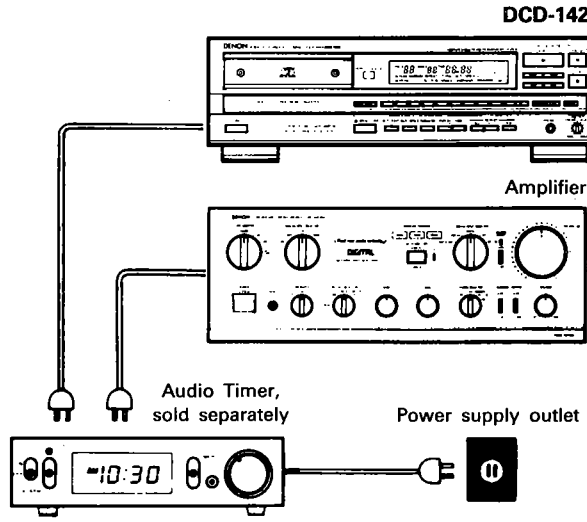

- When the RANDOM button is pressed, the RANDOM indicator lights and random play begins automatically.
- If the RANDOM button is pressed when tracks have been programmed, only the programmed tracks will be played, in random order.
- If the RANDOM button is pressed when the repeat function is set, the tracks will be played through once in random order, then played through again in a different order, etc.
- During random play, all of the tracks on the disc are displayed rapidly on the TRACK NO. display, and the track which will be played next cannot be known until playback starts.

**NOTE:**
- The remaining time in the total mode cannot be displayed during random play.
- If the RANDOM button is pressed when in the auto edit mode, the auto edit mode is cleared.

## TIMER-CONTROLLED PLAYBACK

■ **Operation**
1. Turn on the power of all system components.
2. Set the input selector on the amplifier to correspond to the inputs the CD player is connected to.
3. Make sure a disc has been loaded in the disc holder.
4. Check the time on the timer and then set the desired turn-on time.
5. Turn the audio timer ON. Power is turned off automatically in all components connected to the timer.
6. When the preset turn-on time is reached, power is turned on in the system components, and CD playback starts from the first track.

■ **Connection**



## THE COMPACT DISC

**1. Precautions on handling compact discs**

- Do not allow fingerprints, oil or dust on the surface of the compact disc. If the signal surface is dirty, wipe it off with a soft, dry cloth. Wipe in circular motions from the center and out.
  Use of DENON's AMC-12 CD cleaner is recommended.
- Do not use water, benzene, thinner, record sprays, electrostatic proof chemicals, or silicone-treated cloth to clean discs.
- Always use care when handling discs to prevent damaging the surface, in particular when removing a disc from the case and returning it.
- Do not bend compact discs.
- Do not apply heat to compact discs.
- Do not enlarge the hole in the center of the disc.
- Do not write on the disc and do not attach any labels.
- Condensation will form on the disc surface if it is brought into a warm room from a cold area, such as outdoors during winter. Wait until the condensation disappears. Never dry discs with hair dryers, etc.

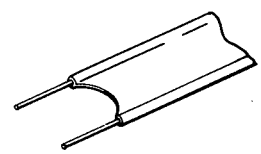
**2. Precautions on storage**

- After playing a disc, always return it to its case.
- Keep discs in the cases when they are not to be played. This will protect them from dust and dirt and prolong their service life.
- Do not store discs in the following places:
  1) Places exposed to direct sunlight for a considerable time.
  2) Places subject to accumulation of dust or high humidity.
  3) Places exposed to high temperatures, such as close to heater outlets.

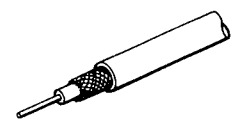
## INSTALLATION PRECAUTIONS

The CD player uses a microcomputer for controlling internal electronic circuits. In the event that the player is used while a near-by tuner or TV is turned on, although unlikely, interference could occur either in the sound from the tuner or the picture of the TV. To avoid this, please take the following precautions.

- Keep the CD player as far away from the tuner or TV set as possible.
- Keep the power cable and connecting cable of the CD player separate from the antenna wires of the tuner and TV.
- Interference is particular likely to occur when an indoor antenna or a 300-ohm feeder cable is used. Thus, use of an outdoor antenna and 75-ohm coaxial cable is strongly recommended.



300-ohm feeder cable



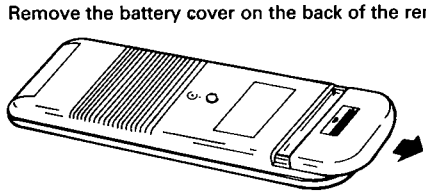
75-ohm coaxial cable

## PLAYBACK USING THE REMOTE CONTROL UNIT

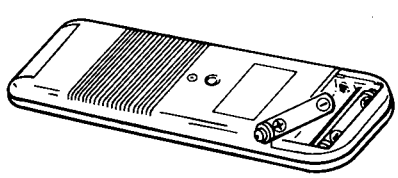
The accessory RC-217 remote control unit can be used to control the CD player from a convenient distance.

**(1) Inserting the dry cell batteries**

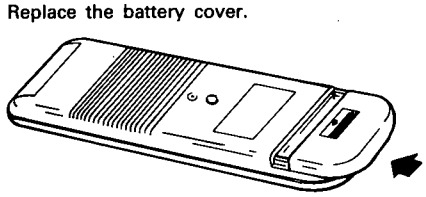
1. Remove the battery cover on the back of the remote control unit.



2. Insert two SUM-4 (standard size AAA) dry cell batteries with correct polarity as indicated inside the battery compartment.

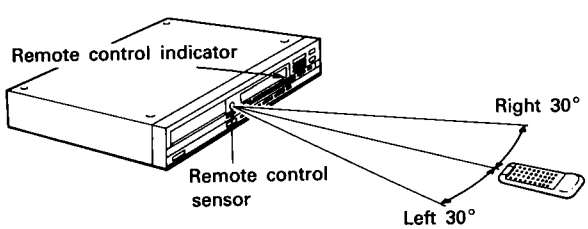


3. Replace the battery cover.



**(2) Directions for Use**

- Operate the remote control unit while pointing it towards the remote control sensor on the CD player (see below).




**Notes on the Batteries**

- The remote control unit uses standard size AAA dry cell batteries.
- The batteries will need to be replaced approximately once a year. Replacement may be necessary earlier depending on how much the remote control unit is used.
- If, in less than a year from the time new batteries were inserted, the remote control fails to operate the CD player from a near-by position, it is time to replace the batteries.
- Insert the batteries properly, following the polarity diagram inside the battery compartment, in other words make sure (+) and (–) terminals are properly aligned.
- Batteries are prone to damage and leakage.
  Therefore:
  - Do not combine new batteries with used ones.
  - Do not combine different types of batteries.
  - Do not jumper opposite poles of the batteries, expose them to heat, break them open nor expose of them in open fire.
- If the remote control unit is not to be used for a long period of time, remove the batteries from the unit.
- If the batteries have leaked, remove any traces of battery fluid from the battery compartment, wiping thoroughly with a dry cloth. Then insert new batteries.

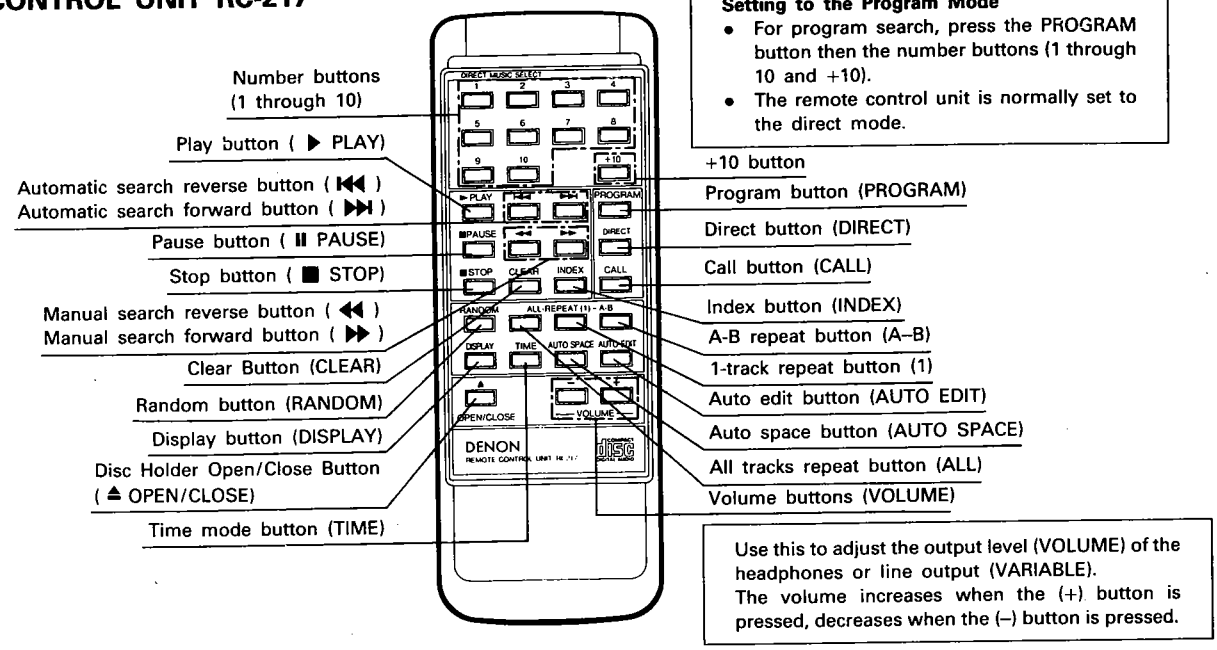
When a remote control signal is received, the remote control indicator on front of the CD player lights briefly.

- The remote control unit can be used at a distance up to 8 meters in a straight line from the CD player. This distance decreases if there are obstructions blocking the signal path or when the remote control unit is operated at an angle from the remote control sensor.
- The buttons on the remote control unit have identical functions with those on the CD player.
  However, the following functions cannot be remote controlled: Power ON/OFF.

**Cautions on Use**

- Do not press the operation buttons on the main unit and on the remote control unit simultaneously, as this will result in malfunction.
- The remote control unit may not operate properly if the remote control sensor is exposed to direct sunlight or strong artificial lighting, or if there is an object between the remote control unit and the remote control sensor.

## REMOTE CONTROL UNIT RC-217


Number buttons (1 through 10)
Play button ( ▶ PLAY)
Automatic search reverse button ( ⏮ )
Automatic search forward button ( ⏭ )
Pause button ( ⏸ PAUSE)
Stop button ( ■ STOP)
Manual search reverse button ( ◀◀ )
Manual search forward button ( ▶▶ )
Clear Button (CLEAR)
Random button (RANDOM)
Display button (DISPLAY)
Disc Holder Open/Close Button ( ⏏ OPEN/CLOSE)
Time mode button (TIME)
+10 button
Program button (PROGRAM)
Direct button (DIRECT)
Call button (CALL)
Index button (INDEX)
A-B repeat button (A–B)
1-track repeat button (1)
Auto edit button (AUTO EDIT)
Auto space button (AUTO SPACE)
All tracks repeat button (ALL)
Volume buttons (VOLUME)
DENON

**Setting to the Program Mode**

- For program search, press the PROGRAM button then the number buttons (1 through 10 and +10).
- The remote control unit is normally set to the direct mode.

Use this to adjust the output level (VOLUME) of the headphones or line output (VARIABLE). The volume increases when the (+) button is pressed, decreases when the (–) button is pressed.

- **Direct Search**
  Normally, direct search is possible simply by pressing the desired number buttons.
- **Program Search (During playback, the track which is currently playing is programmed as the 1st track.)**
  Press the PROGRAM button, then press the number buttons.
  For example, to program tracks number 3, 11, and 5, press PROGRAM → 3 → +10 and 1 → 5.
  To cancel the program, press the DIRECT button.
- **Inputting the Track Numbers**
  For track numbers below 10, simply press the corresponding button. For track numbers of 11 and greater, press the +10 then the number buttons.
  For example, for track number 22 press +10 twice then 2.
- **Volume**
  The volume control on the unit will operate when the volume buttons are pressed. The volume can be checked by looking at the position of the control.

## TROUBLESHOOTING

**If the CD player does not seem to be functioning properly, check the following:**

**Disc holder does not open or close.**
- Is the power on?

**When a disc is loaded, 00:00:00 is displayed.**
- Is the disc loaded properly? ..... See page 6

**When the play button ( ▶ PLAY) is pressed, playback does not start.**
- Is the disc dirty or scratched? ..... See page 10

**There is no sound, or it is distorted.**
- Is the output cord properly connected to the amplifier? ..... See page 6
- Have the amplifier controls been set correctly?

**A specific section of the disc will not play.**
- Is the disc dirty or scratched? ..... See page 10

**Programmed playback does not work.**
- Have programming been properly done? ..... See pages 7 and 10

**Incorrect operation when buttons on the remote control are pressed.**
- Is the remote control unit being operated too far from the CD player? ..... See page 10
- Are there obstacles blocking the ray?
- Is the remote control sensor exposed to strong light?
- Are the batteries exhausted?

## SPECIFICATIONS

**AUDIO**

| | |
|---|---|
| **No. of Channels:** | 2 channels |
| **Frequency Response:** | 2 ~ 20,000 Hz |
| **Dynamic Range:** | 97 dB |
| **Signal-to-noise Ratio:** | 108 dB |
| **Harmonic Distortion:** | 0.003% (1 kHz) |
| **Separation:** | 103 dB (1 kHz) |
| **Wow & Flutter:** | Below measurable limit: (±0.001% W.peak) |
| **Output Voltage:** | 2.0 V, VARIABLE 0~2.0 V |
| **DISCS** | Compact Disc format |
| **GENERAL CHARACTERISTICS** | |
| **Power Supply:** | 50/60 Hz, voltage is shown on rating label |
| **Power Consumption:** | 13 W |
| **Dimensions:** | 434 (17.1 in) W × 135 (5.2 in) H × 310 (12.2 in) D mm |
| **Weight:** | 6.3 kg |

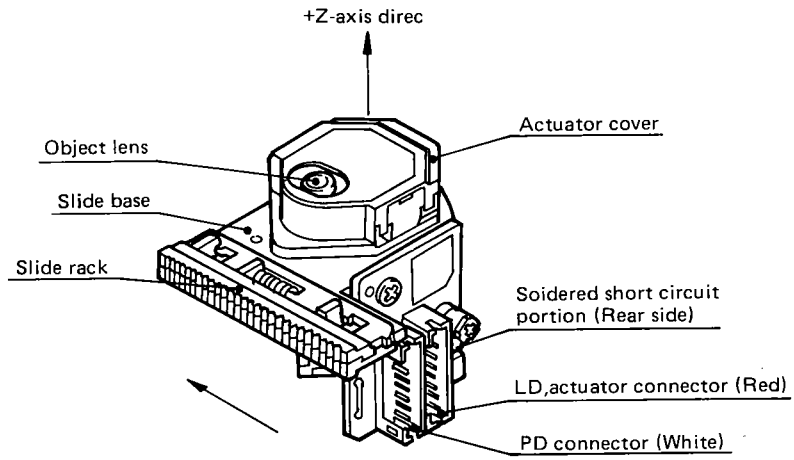
**FUNCTIONS AND DISPLAY**

| | |
|---|---|
| **Functions:** | Direct selection, automatic search, programmed playback, repeat playback, manual search, auto space, time mode, auto edit, emphasis feature |
| **Display:** | Track number, time, music calendar, and engaged modes |
| **Others:** | Headphones jack |
| **REMOTE CONTROL UNIT** | RC-217 |
| **Remote Control System:** | Infrared pulse system |
| **Power Supply:** | 3 V DC; two SUM-4 (standard size AAA) dry cell batteries |
| **External Dimensions:** | 60 (2.4 in) W × 165 (7.0 in) H × 17 ( 0.7 in) D mm |
| **Weight:** | 95 g (including batteries) |
| **SUPPLIED ACCESSORIES** | Pin-plug connection cord |

* Design and specifications are subject to change without notice in the course of product improvement.

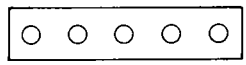
## NOTE FOR HANDLING OF LASER PICK-UP

### DESCRIPTION OF THE COMPONENTS




**Label**

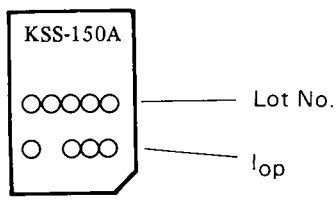
1. Serial number



This denotes the serial number used for quality control in the manufacturing plant.

Note: The numbers of figures in English numerals may be changed.

2. Label

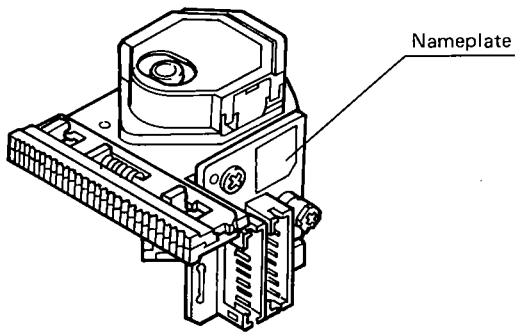



year
(last figure)
day month | quality control No.
○○ ○ ○ ○

but Oct. Nov. and Dec. are expressed by alphabetical letters of X, Y and Z.

10 1 $10^{-1}$
quality control ○ ○ ○ ○
LD drive current

3. Position of the labels

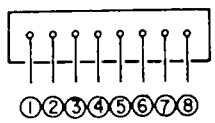



Note:
- The expressed unit is by mA, with omission of the decimal point as for example, 56.5 mA will be expressed as 565, but the head of English letter means the control in the manufacturing plant.
- If a voltage value in between No. 2 and No. 6 pins of TP102 of the servo and signal processor unit, the value of laser diode current "iop" can be found by a formula

"iop 1" = $\frac{V1}{22}$.

## ELECTRICAL PIN CONNECTION

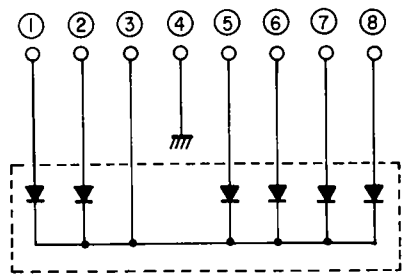
### 1. PD connector (JAPAN SOLDERLESS TERMINAL MFG CO. LTD "PH series" 8 pin)



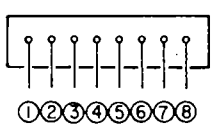

COLOR : WHITE

| Pin No. | PD element |
|---|---|
| ① | F |
| ② | E |
| ③ | K |
| ④ | GND |
| ⑤ | A |
| ⑥ | B |
| ⑦ | C |
| ⑧ | D |

**PC Circuit Diagram**



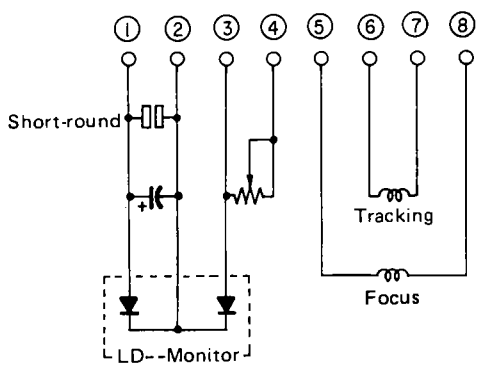

### 2. Actuator & LD connector (JAPN SOLDERLESS TERMINAL, MFG CO. LTD "PH series" 8 pin)




COLOR : RED

| Pin No. | description |
|---|---|
| ① | Laser |
| ② | GND |
| ③ | monitor |
| ④ | reference |
| ⑤ | Fo (-) |
| ⑥ | Tr (+) |
| ⑦ | Tr (-) |
| ⑧ | Fo (+) |

**LD • Actuator Circuit Diagram**



## Cautions for Handling the Laser Pick-up

The laser pick-up KSS-150A is assembled and precisely adjusted using a sophisticated manufacturing process in our plant. Do not disassemble or attempt to readjust it. Please keep the following instructions carefully in handling pick-up.

### 1. Handle with Care

(1) Storage
Do not store the pick-up in dusty, high-temperatured or high-humidity environments.

(2) Please take care for preventing from shock by falling down or careless handling.

### 2. Laser Diode (LD)

(1) Protect your eyes
The laser beam may damage the human eye, since the intensity of the focused spot may reach 7 x $10^3$ W/$cm^2$ even if the intensity at the objective lens is 400 $\mu$W maximum. As the light beam spreads after focused through the objective lens, it does not effect you in the place as far as more than 30 cms. However, do not look at the laser light beam either through the objective lens directly nor another lens or a mirror.

(2) Poison of As
Since the LD chip contains As (Arsenic), as GaAs + GaAlAs, as known as the poison, although the poison is relatively weak, in comparing with others, e.g. $As_2O_3$, $AsCl_3$ etc., and the amount is small, avoid putting the chip in acid or an alkali solution, heating it over 200°C or putting it into your mouth.

(3) Avoid surge current or electrostatic discharge
The LD may be damaged or deteriorated by it's own strong light if a large current is supplied to it, even if only a short pulse.
Make sure that there is no surge current in the LD driving circuit by switches or else. Be careful to handle pick-up as it may be damaged in a moment by human electrostatic discharge. The pins of the LD are short-circuited by solder for protection during shipment.
For safety handling of an LD, grounding the human body, measuring equipments and jig is strongly recommended. And still it is further desirable to make use of mat on the platform and floor for handling the LD.
To open the short circuit, remove the soldering quickly with a soldering iron whose metal part is grounded. The temperature of the soldering iron should be less than 320°C (30W).

### 3. Actuator

(1) The performance of the actuator may be effected if magnetic material is located nearby, since the actuator has a strong magnetic circuit. Do not permit dust to enter through the clearance of the cover.

(2) Cleaning the lens
It may change the specifications by attaching dust or ash on the object lens. Clean the lens with a cleaning paper dampened a little water, not pressing lens with so much strength by the cleaning paper.

### 4. Metal Bearing

As the metal bearing of Cu-compound sintered alloy is impregnated with FROIL946P(*Part No. 529 0054 007), never fail to supply the bushing with the same lubricant at the time of replacing the pick-up.

### 5. Handling

Please handle the laser pick-up with holding the slide base (rosin molded part).
When either a part of human body or some other things may happen to touch directly with the circuit part of P.W. Board, it may cause deterioration, take careful attention in handling this base.

### 6. Deterioration

When difficulty occurs either in focus or tracking adjustment nor able to adjust the focus or tracking, it seems that the laser pick-up is deteriorated. In these cases, check a value of laser diode current and give a decision for deterioration.

### 7. Fundamental Deterioration Decision of Laser Pick-up

(1) If a voltage value in between No. 2 and No. 6 pins of TP102 of the servo and signal processor unit, the value of laser diode current "iop" can be found by a formula "iop1" = $\frac{V1}{22}$.

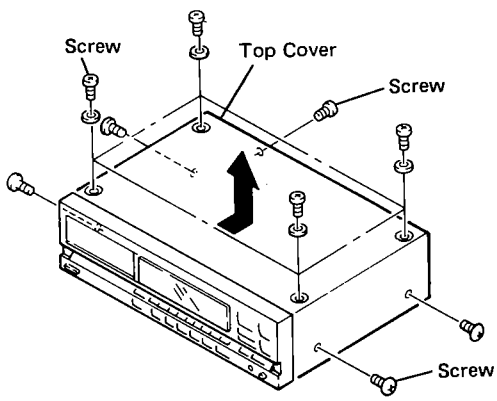
(2) If an "iop" exceeds ±10% compared with the IOP indication on the laser pick-up nameplate, there is a fair chance for deterioration when it is checked under a circumambient temperature 23°C.

(3) When the circumambient temperature changes ±10°C, "iop1" will change ±5%. The "iop1" will also be changed by the passage of time.

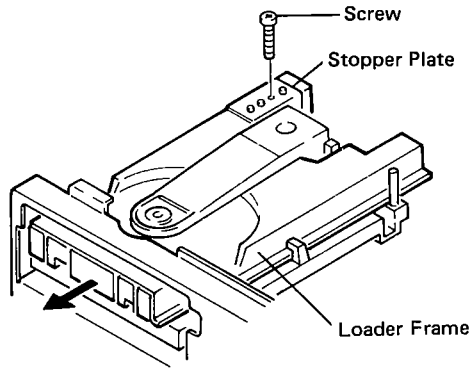
(4) In case of the above conditions taking into consideration and performed the adjustment in proper way, if the HF level at pin No. ① of TP102 on Main Unit, and in between GND4 becomes 1V or lesser values; or ajitter occurs great, the laser pick-up may be deteriorated.

## DISASSEMBLY

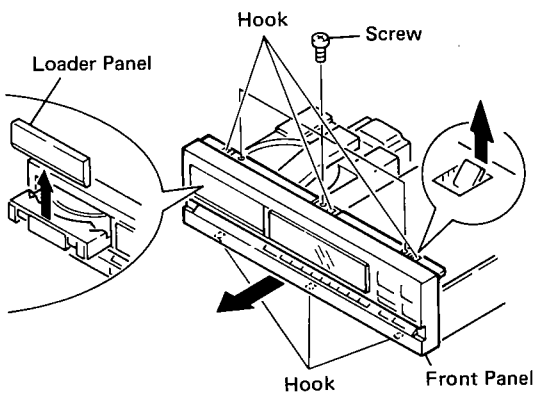
- **Top Cover**
  1. Remove 4 upper screws, rear screw, and 4 side screws.
  2. Remove Top Cover to arrow direction clear of both sidees.



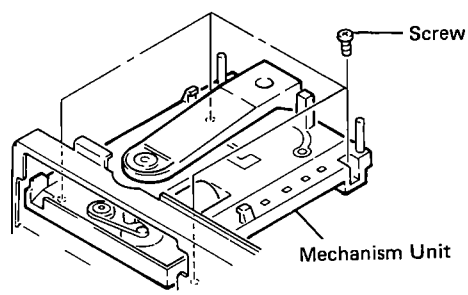

- **Loader**
  1. Remove screw, and remove Stopper Plate.
  2. Remove Loader Frame forward.



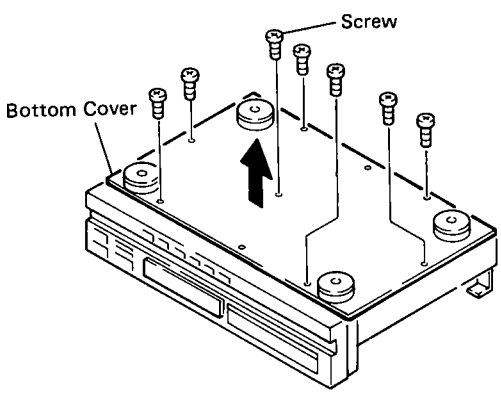

- **Front Cover**
  1. Pull Loader forward and remove Loader Panel.
  2. Remove 3 screws.
  3. Remove Front Panel clear of upper and lower hooks.



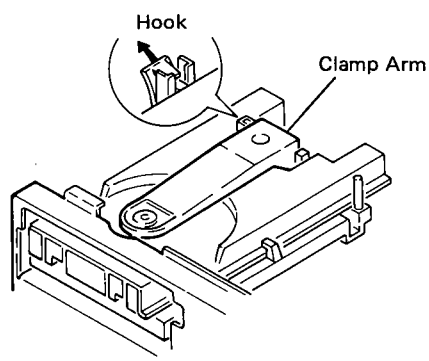

- **Mechanism Unit**
  1. Remove 4 screws.
  2. Remove Mechanism Unit.




- **Botton Plate**
  Remove 7 screws.




- **Clamp Arm**
  Remove hook as arrow direction.



# ADJUSTMENT

Microcomputer built in the unit, comprises service program to facilitate servo adjustment by pushing operation button.

## 1. Start service program

(1) Turn power switch OFF.
(2) Shortcircuit pins ③, ④ of connector (TP102) on P.W.B. (Main Unit)
(Caution) Do not touch other pins.
(3) Turn power switch ON.
(Service program starts, and displays track number 01)

(Caution)
- When service program started normal operation of buttons will be defeated.

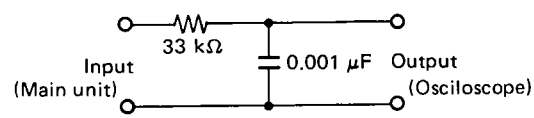
## 2. Service program function

| Button | Function | Description |
|---|---|---|
| ⏏ OPEN/CLOSE | Opens or closes the disc holder. | • Opens or closes only when disc is stopped.<br>• Operate other keys after open or close . |
| ■ STOP | Stops system function. | • Displays track number 01 .<br>• Push when adjustment completed, or do it again. |
| ▶ PLAY | Starts focus servo and disc turns. | • Push when adjust tracking offset.<br>• When completed, displays track number 02 . |
| ❚❚ PAUSE | Starts focus servo, tracking servo, slide servo, spindle servo. | • When PLAY button is pushed, starts tracking servo and slide servo.<br>• When completed, track number 03 . |
| Other button | No normal operation. | • Do not operate buttons other than above.<br>• If misoperated, immediately turn power switch OFF. |

(Caution)
- Do not use remote control during service program mode.

## 3. Adjustment

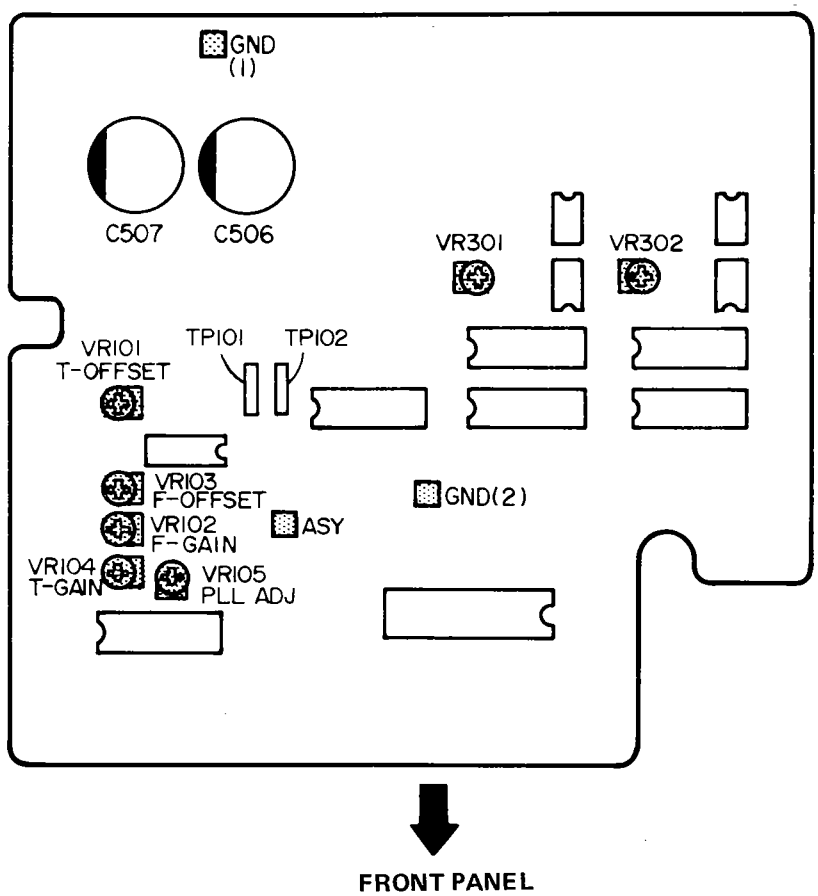
(1) Prior to start adjustment
Before adjusting laser P.U. and spindle motor, be sure adjust turntable height at the time of turntable assembly.
(2) Necessary equipment for adjustment
1 Dual trace oscilloscope
2 Reference disc (CA-1094) 富田靖子
3 Oscillator (10 Hz ~ 10 kHz, 0 ~ 3 Vp-p)
4 Frequency counter (readable more than 5 MHz)
5 Filter for measurement




(Filter for measurement)

(3) Location

**MAIN UNIT**
**2U-1752B/1818A-1**

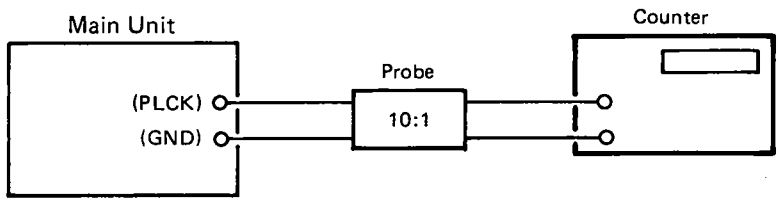



(4) Preset

| | | |
|---|---|---|
| 1. | Start service program. | |
| 2. | Preset VR101 ~ 105 as per left figure. | VR101 (T-OFFSET) 3 O'clock<br>VR103 (F-OFFSET) 3 O'clock<br>VR102 (F-GAIN) 3 O'clock<br>VR104 (T-GAIN) 3 O'clock<br>VR105 (PLL) 6 O'clock |
| 3. | Step. | 1. PLL<br>2. Tracking offset<br>3. Focus gain<br>4. Focus offset<br>5. Tracking gain<br>6. Tracking offset recheck. |

## 4. PLL Adjust

Connection



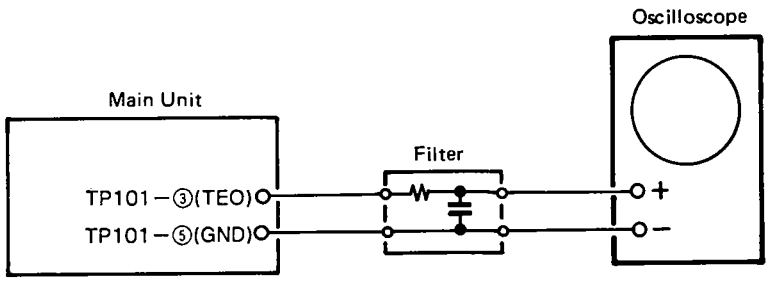

- Ground Test point [ASY] to GND1 or GND2.

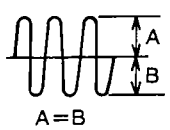
| Adjust | Check | Step |
|---|---|---|
| (Volume) | (Counter) | • Turn PLL volume VR105 so that frequency counter reads 4.32 MHz. |
| VR105 | 4.32 MHz ± 10 kHz | |

Note: Some P.C.Board has no GND2.

## 5. Tracking offset

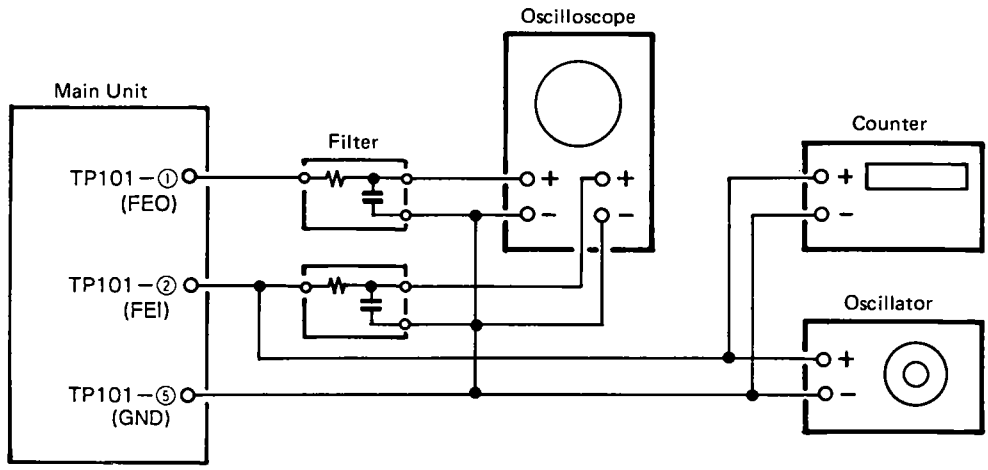
Connection




| Oscilloscope (DC range) | | Adjust | Check | Step |
|---|---|---|---|---|
| V | H | (Volume) | (Oscilloscope) | 1. Push [▲ OPEN/CLOSE] and load disc holder reference disk. |
| 0.1V/div | 1~2 ms/div | VR101 |  A=B | 2. Push [▲ OPEN/CLOSE] and close disc holder.<br>3. Push [▶ PLAY] to turn disc. (Displays track number 02 )<br>4. Short (+) (-) of oscilloscope and check the base line.<br>5. Adjust VR101 [T-OFFSET] to equalizer upper and lower amplitude of the waveform. |

## 6. Focus gain

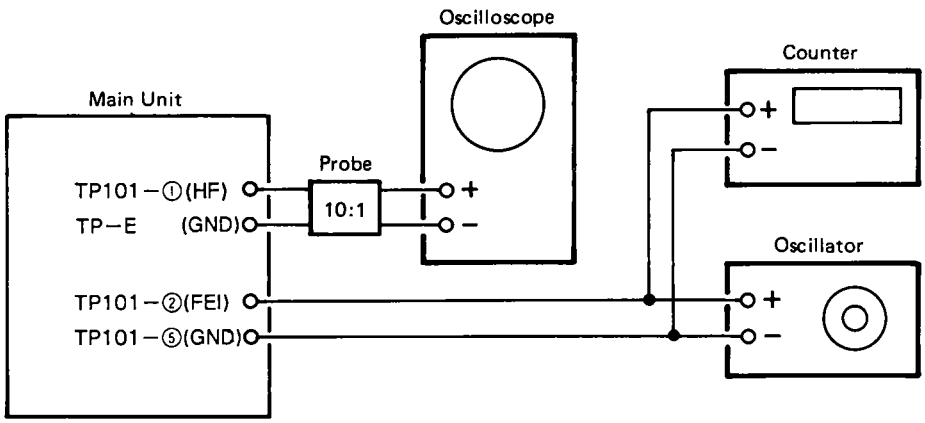
Connection

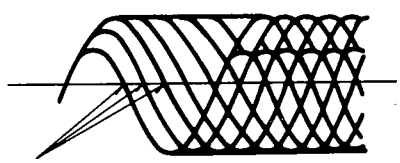
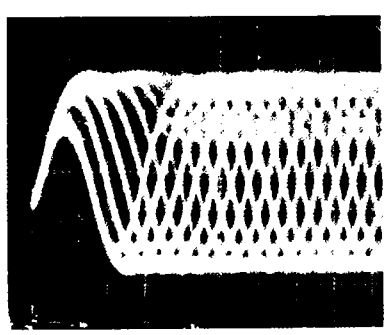



| Oscillator | Counter | Oscilloscope V | Oscilloscope H | Adjust | Check | Step |
|---|---|---|---|---|---|---|
| 750 Hz<br>1 Vp-p<br>(±0.1 V) | 750 Hz | • DC range<br>• X-Y mode | | VR102 | (Oscilloscope)<br>Y axis<br>X axis<br>Phase 90°<br>Waveform not right<br>X axis<br>Y axis | 1. Push [II PAUSE] (Displays track number 03 )<br>2. Set oscillator to 750 Hz/1 Vp-p.<br>3. Switch oscilloscope input to X-Y mode.<br>4. Adjust VR102 [F-GAIN] to symmetrize Lissajous figures to X and Y axes. |

## 7. Focus offset

Connection



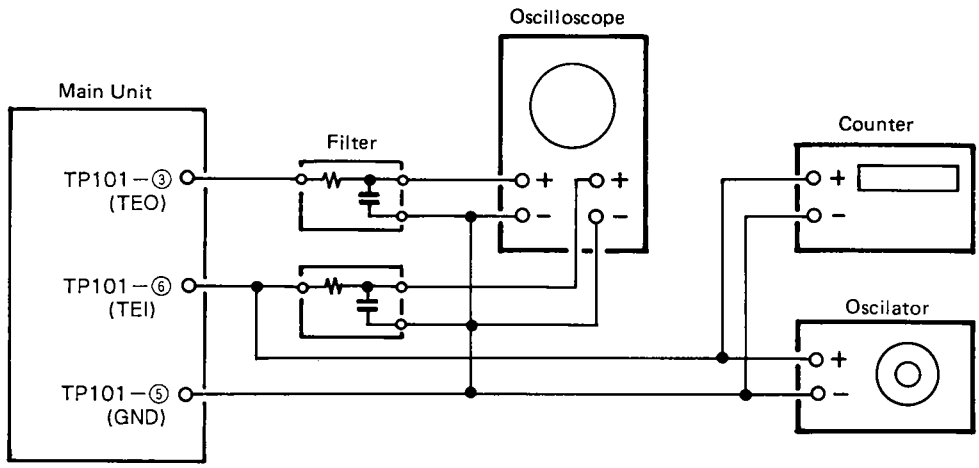

| Oscillator | Counter | Oscilloscope | | Adjust | Check |
|---|---|---|---|---|---|
| | | V | H | (Volume) | (Oscilloscope) |
| 750 Hz<br>1 Vp-p<br>(±0.1 V) | 750 Hz | 50 mV/div<br>or<br>20 mV/div | 0.2 μs/div<br>or<br>0.5 μs/div | VR103 |  <br>Adjust to minimize pattern jitter.<br>  <br>Pattern |
| | | • Set input mode to ALTERNATE or CHOPPER. | | | |

Step

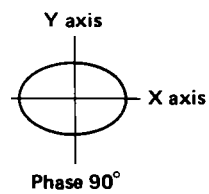
1. Push [II PAUSE].
2. Set oscillator to 750 Hz, 1 Vp-p (±0.1V)
3. VR103 [F-OFFSET] to minimize pattern jitter.

## 8. Tracking gain

Connection




• Caution: Connect oscillator after [II PAUSE] pushed and servo function started.

| Oscillator | Counter | Oscilloscope V | Oscilloscope H | Adjust | Check | Step |
|---|---|---|---|---|---|---|
| • 2.1 kHz (±120 Hz)<br>• 3 Vp-p (±0.1V) | 2.1 kHz (±120 Hz) | • DC range<br>• X-Y mode | | VR104 |  | 1. Push [II PAUSE]. (Displays track number 03 )<br>2. Connect oscillator.<br>3. Set oscillator to 2.1 kHz/3 Vp-p.<br>4. Switch oscilloscope input to X-Y mode.<br>5. Adjust VR104 [T-GAIN] to symmetrize Liseajous figures to X-Y axes. |



## 9. Tracking offset adjustment check

(1) Adjust tracking offset again.
(2) Push [■STOP] and stop disc.
(3) Push [▶PLAY] and check disc turns.
Note: If disc does not turn, push [▶PLAY] again and check track number 02 is diasplayed.
(4) Check oscilloscope waveform upper and lower amplitude are same to base line.
(5) Push [■STOP] and stop disc.
(6) Push [▲OPEN/CLOSE] and remove the reference disc.

## HEAT RUN MODE FUNCTION

### 1. Heat Run Mode

**1) To active**

Push and hold 1, 4, and 7 keys simultaneously, and turn power on. The remote control sensor indicator lights to show that the unit is shifted to Heat Run Mode.

Be sure the disc has been loaded.

Press the disc holder open/close button (▲OPEN/CLOSE) to cancel Heat Run Mode.

**2) Operation**

Shifting the unit to Play Mode from Heat Run Mode makes the unit replays from the first music, by opening the loader once and re-closes it when finish playing the last music (comes into lead out).

Hereafter, operates open/close of loader, servo on, reads TOC, and repeats playing the two music the first and last ones.

If a system error occurs during Heat Run Mode, it displays the error message TNO on the INDEX, and stops the operation. And displays the previous operation cycle number on TIME.

1. E1
   When focus servo is ineffective:
   - 1-1 E1-00 No FOK avails.
   - 1-2 E1-01 FOK avails but no FZC.
   - 1-3 E1-02 Both FOK and FZC avail, but FZC is short of masking time.
   - 1-4 E1-03 Both FOK and FZC avail, but FZC did not turn to "L" within specified time.
2. E2
   Disc turns, but fails to detect synchronous pattern (No GFS).
3. E3
   Fails to detect synchronous pattern (No GFS drives.):
   - 3-1 E3-00 During PLAY.
   - 3-2 E3-01 During SEARCH.
4. E4
   Servo avails, but fails to read TOC:
   - 4-1 E4-00 Fails to read subcode.
   - 4-2 E4-01 Reads subcode, but fails to lead-in.
   - 4-3 E4-02 Subcode and lead-in avail, but fails to read TOC within 15s.
5. E5
   Defective loader. (Switch fails to turn on.)
6. E6
   PU innermost circle switch fails to turn off.
7. E7
   PU innermost circle switch fails to turn on.

### 2. Chucking Test

**1) To activate**

Start regular Heat Run Mode, and press II (PAUSE) twice times, or 10 key. (During PLAY)

**2) Operation**

Repeats Close/Open loader, Servo on, reads TOC, selection of the first music.

**3) Error Message**

The same as per regular Heat Run Mode. Always displays number of operation cycle on TIME, immediately after the loader closes.

### 3. Sound Skipping Test

**1) To activate**

Start regular Heat Run Mode, and press +10 key. (During PLAY)

**2) Operation**

If sound skipping occurs more than ±8 frame (no continuous subcode), it stops the operation, and displays error message.

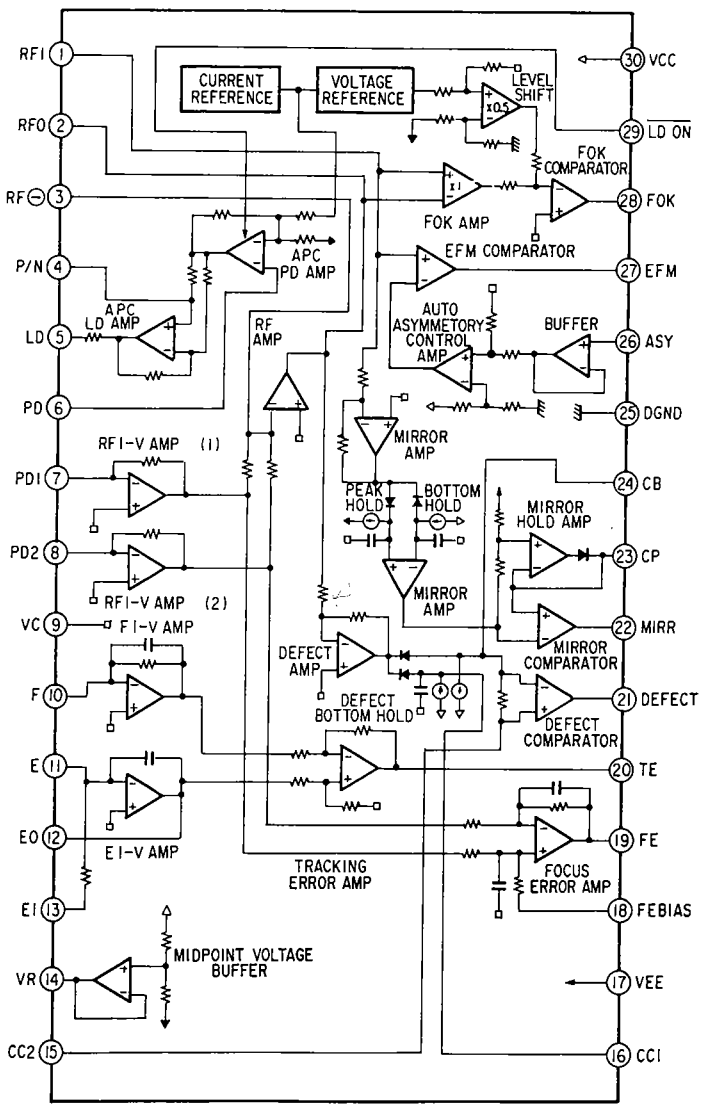
**3) Error Message**

E8 Sound skipping occurs.
Displays number of operation cycle on TIME.
Then, if press any key, display changes, and displays the section where skipping occurs on TNO INDEX TIME.

E1~E7 Same as per regular Heat Run Mode.

## IC TERMINAL FUNCTION

### CXA1081S



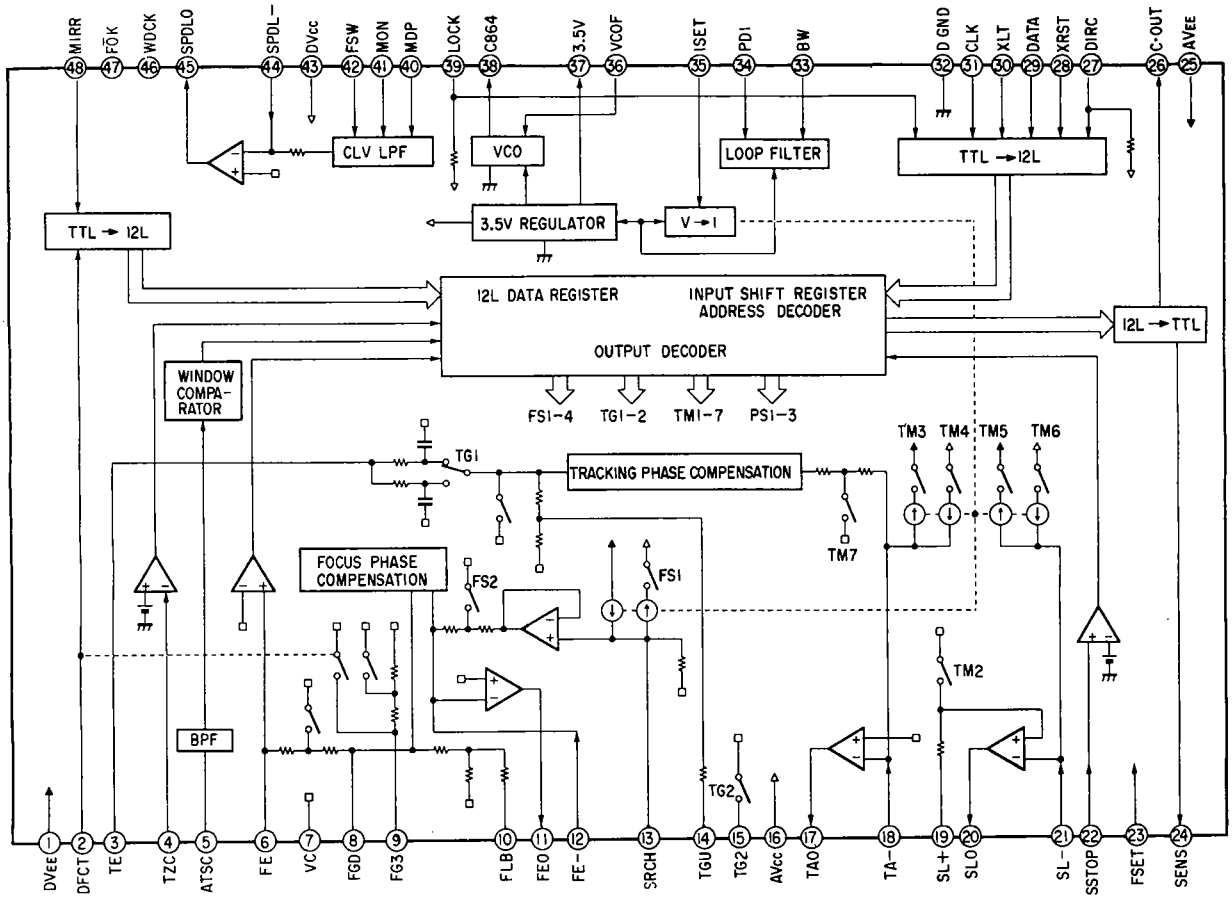
## CXA1081S Terminal Function

| Terminal No. | Terminal Symbol | I/O | DC voltage (V) | Terminal Function |
|---|---|---|---|---|
| 1 | RFI | I | 0 | Input terminal of capacitance coupled RF summing amplifier output. |
| 2 | RFO | O | $V_{RFO}$ | Terminal for RF summing amplifier output. Check point of Eye pattern. |
| 3 | RF(–) | I | 0 | Feedback input terminal of RF summing amplifier. |
| 4 | P/N | I | 0 (VC) | P-sub/N-sub shifting terminal for Laser Diode (LD). (DC voltage: at N-sub.) |
| 5 | LD | O | -1.8 | Output terminal of APC (Automatic Power Control) LD amplifier. (DC voltage: at N-sub, PD opened.) |
| 6 | PD | I | 0 | Input terminal of APC (Automatic Power Control) PD amplifier. (DC voltage: opened.) |
| 7 | PD1 | I | 0 | Reverse input terminal of RF I-V amplifier (1). Receives a input current through A + C terminals of photo diode. |
| 8 | PD2 | I | 0 | Reverse input terminal of RF IV amplifier (2). Receives a input current through B + D terminals of photo diode. |
| 9 | VC | – | 0 | At ± dual-power supply: Becomes GND.<br>At mono-power supply: Becomes VR. (connect to pin 14.) |
| 10 | F | I | 0 | Reverse input terminal of F I-V amplifier.<br>Receives a input current through F terminal of photo diode. |
| 11 | E | I | 0 | Reverse input terminal of E I-V amplifier.<br>Receives a input current through E terminal of photo diode. |
| 12 | EO | O | 0 | Output terminal of E I-V amplifier. |
| 13 | EI | I | 0 | Feedback input terminal of E I-V amplifier. For gain controlling of E I-V amplifier. |
| 14 | VR | O | $V_{CVO}$ | Output terminal of DC voltages $(V_{CC} + V_{EE})/2$. |
| 15 | CC2 | I | 1.0 | Input terminal of capacitance coupled defect bottom hold output. |
| 16 | CC1 | O | 1.2 | Output terminal of defect bottom hold. |
| 17 | $V_{EE}$ | – | -2.5 | At ± dual-power supply: Becomes negative power supply terminal.<br>At mono-power supply: Becomes GND. |
| 18 | FE BIAS | I | 0 | Bias terminal for non-reverse side of focus error amplifier.<br>For CMR controlling of focus error amplifier. |
| 19 | FE | O | $V_{FEO}$ | Output terminal of focus error amplifier. |
| 20 | TE | O | $V_{TEO}$ | Output terminal of tracking error amplifier. |
| 21 | DEFECT | O | $V_{DFCTL}$ | Output terminal of defect comparator. (DC voltage: Connect a 10 kΩ load resistance.) |
| 22 | MIRR | O | $V_{MIRL}$ | Output terminal of MIRR comparator. (DC voltage: Connect a 10 kΩ load resistance.) |
| 23 | CP | I | -1.3 | Connecting terminal for MIRR hold capacitor. Non-reverse input terminal of MIRR comparator. |
| 24 | CB | I | 0 | Connecting terminal for defect bottom hold capacitor. |
| 25 | D GND | – | -2.5 | At ± dual-power supply: GND.<br>At mono-power supply: GND ($V_{EE}$). |
| 26 | ASY | I | – | Input terminal of auto-asymmetry control. |
| 27 | EFM | O | $V_{EFMH}$ | Output terminal of EFM comparator. (DC voltage: Connect a 10 kΩ load resistance.) |
| 28 | FOK | O | $V_{FOKL}$ | Output terminal of focus OK comparator. (DC voltage: Connect a 10kΩ load resistance.) |
| 29 | $\overline{\text{LD ON}}$ | I | -2.5 (D GND) | ON/OFF shifting terminal for laser diode (LD). (DC voltage: At LD ON.) |
| 30 | $V_{CC}$ | – | 2.5 | Positive power supply terminal. |

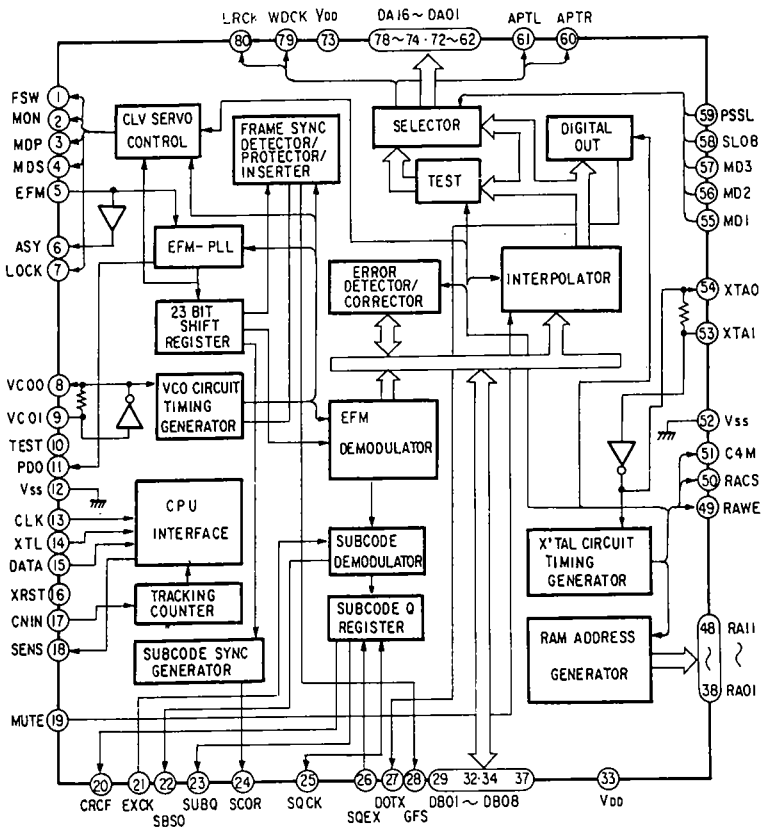
## CXA1182AS Terminal Function

| Terminal No. | Terminal Symbol | Terminal Function |
|---|---|---|
| 2 | DFCT | Defect signal input terminal. Defect measure circuit activates at "H". |
| 3 | TE | Tracking error signal input terminal. |
| 4 | TZC | Tracking zero cross comparator input terminal. |
| 5 | ATSC | Input terminal of ATSC detecting window comparator. |
| 6 | FE | Focus error signal input terminal. |
| 8 | FGD | In case of reducing higher range gain of focus servo, connect a capacitor between this terminal and terminal number (9). |
| 9 | FS3 | Shifts higher range gain of focus servo by FS3 ON/OFF. |
| 10 | FLB | Terminal for external time constant to increase lower range of focus servo. |
| 11 | FEO | Focus drive output. |
| 12 | FE(–) | Reverse input terminal for focus amplifier. |
| 13 | SRCH | Terminal for external time constant to make focus search waveform. |
| 14 | TGU | Terminal for external time constant to shift higher range gain of tracking. |
| 15 | TG2 | Terminal for external time constant to shift higher range gain of tracking. |
| 17 | TAO | Tracking drive output. |
| 18 | TA(–) | Reverse input terminal for tracking amplifier. |
| 19 | SL(+) | Non-reverse input terminal of sled amplifier. |
| 20 | SLO | Sled drive output. |
| 21 | SL(–) | Reverse input terminal of sled amplifier. |
| 22 | SSTOP | Terminal for limit switch ON/OFF to detect disc inner most circle. |
| 23 | FSET | Terminal to compensate peak in focus tracking phase, and for setting $F_O$ in CLV LPF. |
| 24 | SENS | Terminal to output FZC, AS, TZC, SSTOP, $\overline{BUSY}$ by command from CPU. |
| 26 | C. OUT | Terminal to output signal for track number count. |
| 27 | DIRC | Terminal is used at the time of 1 track jump. A 47 kΩ pull up resistor is included. |
| 28 | XRST | Reset input terminal. Resets at "L". |
| 29 | DATA | Serial data input from CPU. |
| 30 | XLT | Latch input from CPU. |
| 31 | CLK | Serial data transfer clock input from CPU. |
| 33 | BW | Terminal for external time constant of loop filter. |
| 34 | PDI | Input terminal of PDO for CXD1125 phase comparator. |
| 35 | ISET | Delivers a current to set the height of focus search, track jump, and sled kick. |
| 36 | VCOF | Resistance value between this terminal and terminal (37) is nearly proportion to VCO free-run frequency. |
| 38 | C864 | Output terminal of 8.64 MHz VCO. |
| 39 | LOCK | Reckless drive protection circuit activates at "L". A 47 kΩ pull up resistor is included. |
| 40 | MDP | Terminal to connect MDP terminal of CXD1125. |
| 41 | MON | Terminal to connect MON terminal of CXD1125. |
| 42 | Fsw | Terminal for external LPF time constant of CLV servo error signal. |
| 44 | SPDL(–) | Reverse input terminal for spindle drive amplifier. |
| 45 | SPDLO | Spindle drive output. |
| 46 | WDCK | Clock input for auto-sequence. Normally applied 88.2 kHz. |
| 47 | FOK | FOK signal input terminal. |
| 48 | MIRR | MIRR signal input terminal. |

## CXA1182S




## CXD1125Q



## CXD1125Q Terminal Function

| Terminal No. | Terminal Symbol | I/O | Terminal Function |
|---|---|---|---|
| 1 | FSW | O | Output to shift time constant of output filter for spindle motor. |
| 2 | MON | O | ON/OFF control output for spindle motor. |
| 3 | MDP | O | Drive output for spindle motor. Rough control at CLV-S mode and phase control at CLV-P mode. |
| 4 | MDS | O | Drive output for spindle motor. Speed control at CLV-P mode. |
| 5 | EFM | I | Input of EFM signal from RF amplifier. |
| 6 | ASY | O | Output to control slice level of EFM signal. |
| 7 | LOCK | O | Sampling GFS signal by WFCK/16 and if it is "H", delivers "H"; if it is continuously "L" 8 times, delivers "L". |
| 8 | VCOO | O | VCO output. When EFM signal is locked, f=8.6436 MHz. |
| 9 | VCOI | I | VCO input. |
| 10 | TEST | I | (0V). |
| 11 | PDO | O | Phase comparing output for EFM signal and VCO/2. |
| 12 | Vss | – | GND (0V). |
| 13 | CLK | I | Serial data transfer clock input from CPU. Latches data by rising edge of clock. |
| 14 | XLT | I | Input of Latch from CPU. Latches 8-bit shift register data (serial data from CPU) to each register. |
| 15 | DATA | I | Input of serial data from CPU. |
| 16 | XRST | I | System reset input. Resets at "L". |
| 17 | CNIN | I | Input of tracking pulse. |
| 18 | SENS | O | Answer to address, output internal condition. |
| 19 | MUTG | I | Input of muting. When internal register A's ATTM is in "L", and MUTG is in "L" for normal condition; "H" for no sound condition. |
| 20 | CRCF | O | Output of CRC check result of sub-code Q. |
| 21 | EXCK | I | Clock input for serial output of sub-code. |
| 22 | SBSO | O | Serial output of sub-code. |
| 23 | SUBQ | O | Q output of sub-code. |
| 24 | SCOR | O | Output of sub-code sync. S0 + S1. |
| 25 | SQCK | I/O | Reading clock of sub-code Q. |
| 26 | SQEX | I | Selection input of SQCK. |
| 27 | DOTX | O | Digital out output. (When CXD1130Q or DO is OFF, output $\overline{\text{WFCK}}$.) |
| 28 | GFS | O | Output of indication for frame sync lock condition. |
| 29 | DB08 | I/O | Data terminal of external RAM. DATA8 (MSB). |
| 30 | DB07 | I/O | Data terminal of external RAM. DATA7. |
| 31 | DB06 | I/O | Data terminal of external RAM. DATA6. |
| 32 | DB05 | I/O | Data terminal of external RAM. DATA5. |
| 33 | $V_{DD}$ | – | Power supply (+5V). |
| 34 | DB04 | I/O | Data terminal of external RAM. DATA4. |
| 35 | DB03 | I/O | Data terminal of external RAM. DATA3. |
| 36 | DB02 | I/O | Data terminal of external RAM. DATA2. |
| 37 | DB01 | I/O | Data terminal of external RAM. DATA1 (LSB). |
| 38 | RA01 | O | Address output of external RAM. ADDR01 (LSB). |
| 39 | RA02 | O | Address output of external RAM. ADDR02. |
| 40 | RA03 | O | Address output of external RAM. ADDR03. |
| 41 | RA04 | O | Address output of external RAM. ADDR04. |
| 42 | RA05 | O | Address output of external RAM. ADDR05. |
| 43 | RA06 | O | Address output of external RAM. ADDR06. |
| 44 | RA07 | O | Address output of external RAM. ADDR07. |
| 45 | RA08 | O | Address output of external RAM. ADDR08. |

| Terminal No. | Terminal Symbol | I/O | Terminal Function |
|---|---|---|---|
| 46 | RA09 | O | Address output of external RAM. ADDR09. |
| 47 | RA10 | O | Address output of external RAM. ADDR10. |
| 48 | RA11 | O | Address output of external RAM. ADDR11. |
| 49 | RAWE | O | Write enable signal output for external RAM. (Active at "L".) |
| 50 | RACS | O | Chip select signal output for external RAM. (Active at "L".) |
| 51 | C4M | O | Dividing output of X'tal. f = 4.2336 MHz. |
| 52 | $V_{SS}$ | — | GND (0V). |
| 53 | XTAI | I | X'tal oscillation circuit input. By selecting of mode, f = 8.4672 MHz or 16.9344 MHz. |
| 54 | XTAO | O | X'tal oscillation circuit output. By selecting of mode, f = 8.4672 MHz or 16.9344 MHz. |
| 55 | MD1 | I | Mode selection input 1. |
| 56 | MD2 | I | Mode selection input 2. |
| 57 | MD3 | I | Mode selection input 3. |
| 58 | SLOB | I | Code switching input for audio data output. At "L" for 2's compliment output; at "H" for offset binary output. |
| 59 | PSSL | I | Mode switching input for audio data output. At "L" for serial output; at "H" for parallel output. |
| 60 | APTR | O | Control output for aperture compensation. In "H" for R-ch. |
| 61 | APTL | O | Control output for aperture compensation. In "H" for L-ch. |
| 62 | DA01 | O | At PSSL = "H" for DA01 (LSB of parallel voice data) output.<br>At PSSL = "L" for C1F1 output. |
| 63 | DA02 | O | At PSSL = "H" for DA02 output; PSSL = "L" for C1F2 output. |
| 64 | DA03 | O | At PSSL = "H" for DA03 output; PSSL = "L" for C2F1 output. |
| 65 | DA04 | O | At PSSL = "H" for DA04 output; PSSL = "L" for C2F2 output. |
| 66 | DA05 | O | At PSSL = "H" for DA05 output; PSSL = "L" for C2FL output. |
| 67 | DA06 | O | At PSSL = "H" for DA06 output; PSSL = "L" for C2PO output. |
| 68 | DA07 | O | At PSSL = "H" for DA07 output; PSSL = "L" for RFCK output. |
| 69 | DA08 | O | At PSSL = "H" for DA08 output; PSSL = "L" for WFCK output. |
| 70 | DA09 | O | At PSSL = "H" for DA09 output; PSSL = "L" for PLCK output. |
| 71 | DA10 | O | At PSSL = "H" for DA10 output; PSSL = "L" for UGFS output. |
| 72 | DA11 | O | At PSSL = "H" for DA11 output; PSSL = "L" for GTOP output. |
| 73 | $V_{DD}$ | — | Power supply (+5V). |
| 74 | DA12 | O | At PSSL = "H" for DA12 output; PSSL = "L" for RAOV output. |
| 75 | DA13 | O | At PSSL = "H" for DA13 output; PSSL = "L" for C4LR output. |
| 76 | DA14 | O | At PSSL = "H" for DA14 output; PSSL = "L" for $\overline{\text{C21O}}$ output. |
| 77 | DA15 | O | At PSSL = "H" for DA15 output; PSSL = "L" for C21O output. |
| 78 | DA16 | O | At PSSL = "H" for DA16 (MSB of parallel voice data) output.<br>At PSSL = "L" for DATA output. |
| 79 | WDCK | O | Strobe signal output. At DF ON, 176.4 kHz. At CXD1125Q or DF OFF, 88.2 kHz. |
| 80 | LRCK | O | Strobe signal output. At DF ON, 88.2 kHz. At CXD1125Q or DF OFF, 44.1 kHz. |

**Note:**

C1F1: ┐ Monitor output for error correction state what C1 is at
C1F2: ┘ decode.

C2F1: ┐ Monitor output for error correction state what C2 is at
C2F2: ┘ decode.

C2FL: Correction state output. Becomes "H" when C2 system in which presently under correction is unable to correct.

C2PO: C2 pointer indication output. Synchronizes with audio data output.

RFCK: Read frame clock output. 7.35 kHz of X'tal system.

WFCK: Write frame clock output. 7.35 kHz when locked on to X'tal system.

$\overline{\text{PLCK}}$: VCO/2 output. When locked to EFM signal, f = 4.3218 MHz.

UGFS: Output of unprotected frame sync pattern.

GTOP: Indication output of frame synchro in protected condition.

RAOV: Overflow and underflow indication outputs of ±4 frame jitter absorbing RAM.

C4LR: Strobe signal. At DF ON, 352.8 kHz. At CXD1125Q or DF OFF, 176.4 kHz.

$\overline{\text{C21O}}$: Reverse output of C210.

C21O: Bit clock output. At DF ON, 4.2336 MHz. At CXD1125Q or DF OFF, 2.1168 MHz.

DATA: Serial data output of audio signal.

## PARTS LIST OF P.W. BOARD

## SERVO & SIG. PRO. UNIT (2U-1752B/1818A)

| Ref. No. | Part No. | Part Name | Remarks |
|---|---|---|---|
| **SEMICONDUCTOR GROUP** | | | |
| IC100 | 2620842002 | CXA-1081S | |
| IC102 | 2621008007 | CXA-1182S | |
| IC103 | 2630565007 | BA15218 | |
| IC201 | 2630423000 | M51953B | |
| IC202 | 2620739005 | TC74HCU04P | |
| IC250 | 2621111004 | M50957-134SP | |
| IC300 | 2621128000 | SM5813APA | |
| IC301,302 | 2621014004 | HG61H04B22P | |
| IC303,304 | 2620672007 | PCM54HP | |
| IC305~308 | 2630568004 | TC74HC4066 | |
| IC311,312 | 2620864006 | uPC4570C | |
| IC313,314 | 2630594007 | NJM2068DAC | |
| IC321 | 2630198005 | NJM4556D | |
| IC322 | 2630565007 | BA15218 | |
| IC401 | 2630565007 | BA15218 | |
| IC500 | 2630553006 | NJM7805FA | |
| IC501 | 2630501003 | NJM79M05FA | |
| IC502,503 | 2680073905 | ICP-N15T | |
| TR101 | 2720025004 | 2SB562(C) | |
| TR103 | 2740136009 | 2SD1913 | |
| TR104 | 2720093007 | 2SB1274 | |
| TR105,107 109,111 | 2740036002 | 2SD468(C) | |
| TR106,108, 110,112 | 2720025004 | 2SB562(C) | |
| TR301 | 2740036002 | 2SD468(C) | |
| TR302 | 2720025004 | 2SB562(C) | |
| TR311~ 314 321,322 | 2740124901 | 2SD1504(E/F) | |
| TR315 | 2690026900 | RN2202(10k-10k) | |
| TR316 | 2690025901 | RN1202(10k-10k) | |
| TR319 | 2710101022 | 2SA933(Q) | |
| TR500 | 2710101022 | 2SA933(Q) | |
| D305 | 2760049011 | 1S2076A | |
| D501~506 | 2760519907 | 1SR35-200AT82 | |
| D507 | 2760501928 | HZ33L-3TD | |
| D508 | 2760051070 | HZ7C-2TE | |
| **RESISTOR GROUP** | | | |
| R105 | 2452148000 | RN14K2E360G | 36Ω 1/4W |
| R106 | 2452153008 | RN14K2E560G | 56Ω 1/4W |
| VR101,102 | 2116056072 | V06PB203 | 20kΩ |
| VR103 | 2116048022 | V06PB103 | 10kΩ |
| VR104 | 2116056072 | V06PB203 | 20kΩ |
| VR105 | 2116064064 | V06PB102 | 1kΩ |
| VR301,302 | 2116056027 | V06PB104 | 100kΩ |
| VR303 | 2110568003 | V1620V20FB103M | 10kΩ |

| Ref. No. | Part No. | Part Name | Remarks |
|---|---|---|---|
| **CAPACITOR GROUP** | | | |
| C103 | 2533614000 | CC45SL1H300J | 30pF 50V |
| C111,117, 146 | 2531024003 | CK45F1H103Z | 0.01μF 50V |
| C120 | 2531055014 | CK45B1H561K | 560pF 50V |
| C129,144, 194 | 2539036006 | CK45=1E104ZT | 0.1μF 25V |
| C130,147 | 2531180028 | CK45B1H102KT | 0.001μF 50V |
| C136,143 | 2533627000 | CC45SL1H101J | 100pF 50V |
| C105,106, 140 | 2533603008 | CC45SL1H100DT | 10pF 50V |
| C148 | 2533639001 | CC45SL1H331J | 330pF 50V |
| C191 | 2533643000 | CC45SL1H471J | 470pF 50V |
| C203 | 2539036006 | CK45=1E104ZT | 0.1μF 25V |
| C210,211 | 2534342041 | CC45SL1H050CT | 5pF 50V |
| C213 | 2539036006 | CK45=1E104ZT | 0.1μF 25V |
| C214 | 2531180028 | CK45B1H102KT | 0.001μF 50V |
| C215 | 2531024003 | CK45F1H103Z | 0.01μF 50V |
| C301,350, 352, 360~365 | 2539036006 | CK45=1E104ZT | 0.1μF 25V |
| C302 | 2533603008 | CC45SL1H100DT | 10pF 50V |
| C303,304, 341,366 | 2531024003 | CK45F1H103Z | 0.01μF 50V |
| C310 | 2533617007 | CC45SL1H390J | 39pF 50V |
| C325,326 | 2533634006 | CC45SL1H201J | 200pF 50V |
| C331,332 | 2533627000 | CC45SL1H101J | 100pF 50V |
| C515~518 | 2531024003 | CK45F1H103Z | 0.01μF 50V |
| C101,150, 151 | 2544260061 | CE04W1H3R3M(SME) | 3.3μF 50V |
| C104 | 2544254048 | CE04W1C101M(SME) | 100μF 16V |
| C115 | 2544260032 | CE04W1HR47M(SME) | 0.47μF 50V |
| C126 | 2544304930 | CE04W1V6R8MT(SME) | 6.8μF 35V |
| C131 | 2544260045 | CE04W1H010M(SME) | 1μF 50V |
| C132 | 2544254019 | CE04W1C220M(SME) | 22μF 16V |
| C138 | 2544260029 | CE04W1HR33M(SME) | 0.33μF 50V |
| C141 | 2543055905 | CE04D1V4R7MBP(SME) | 4.7μF 35V |
| C190 | 2544254022 | CE04W1C330M(SME) | 33μF 16V |
| C305 | 2544260045 | CE04W1H010M(SME) | 1μF 50V |
| C315~318 | 2544254064 | CE04W1C331MT(SME) | 330μF 16V |
| C335,336 | 2544261021 | CE04W1H101MT(SME) | 100μF 50V |
| C335,336, 343,344 | 2544261028 | CE04W1H101M(SME) | 100μF 50V |
| C342 | 2544256059 | CE04W1E221M(SME) | 220μF 25V |
| C353 | 2544254792 | CE04W1C222MC(SME) | 2200μF 16V |
| C354 | 2544254064 | CE04W1C331M(SME) | 330μF 16V |
| C504,505 | 2544254064 | CE04W1C331M(SME) | 330μF 16V |
| C506,507 | 2544254792 | CE04W1C222MC(SME) | 2200μF 50V |
| C512 | 2544261028 | CE04W1H101M(SME) | 100μF 50V |
| C514 | 2544262946 | CE04W1J470M(SME) | 47μF 63V |
| C102 | 2551120055 | CQ93M1H272J | 0.0027μF 50V |
| C113,121 | 2551120068 | CQ93M1H332J | 0.0033μF 50V |
| C114,116, 122,128 | 2551121025 | CQ93M1H103J | 0.01μF 50V |
| C123 | 2551120042 | CQ93M1H222J | 0.0022μF 50V |

| Ref. No. | Part No. | Part Name | Remarks |
|---|---|---|---|
| C134 | 2551121025 | CQ93M1H103J | 0.01μF 50V |
| C137 | 2551120000 | CQ93M1H102J | 0.001μF 50V |
| C139 | 2551120097 | CQ93M1H562J | 0.0056μF 50V |
| C327,328 | 2551120000 | CQ93M1H102J | 0.001μF 50V |
| C329,330 | 2551121025 | CQ93M1H103J | 0.01μF 50V |
| C110,125 | 2561034018 | CF93A1H333J | 0.033μF 50V |
| C124 | 2561034063 | CF93A1H823J | 0.082μF 50V |
| C127,145 | 2561035017 | CF93A1H224J | 0.22μF 50V |
| C135,142 | 2561034076 | CF93A1H104J | 0.1μF 50V |
| C340 | 2561034018 | CF93A1H333J | 0.033μF 50V |
| **OTHER PARTS GROUP** | | | |
| | 2318063009 | PULSE TRANSFORMER | |
| | 2048256005 | 1P PIN JACK | |
| | 2690084007 | GP1F3IT | |
| | 2048109013 | HEADPHONE JACK | |
| | 2048261003 | 4P PIN JACK | |
| X300 | 3990036013 | CRYSTAL (16.9344MHz) | |
| L201,202 | 2350049007 | BEAD INDUCTOR | |
| CB101 | 2050343087 | 8P CONN. BASE (KR-PH) | |
| CB102 | 2050321041 | 4P CONN. BASE (RED) | |
| CB103 | 2050343045 | 4P CONN. BASE (KR-PH) | |
| CB104 | 2050323036 | 3P CONNE. BASE (BLACK) | |
| CB105,202 | 2050343032 | 3P CONN. BASE (KR-PH) | |
| CB106 | 2050406034 | 3P CONN. BASE (KR-PH) | |
| CB201 | 2050321038 | 3P CONN. BASE (RED) | |
| CB501 | 2050343061 | 6P CONN. BASE (KR-PH) | |
| TP102,103 | 2050190065 | 6P NH CONN. BASE | |
| | 2050343003 | 10P CONN. BASE (KR-PH) | |
| | 2050491010 | 31P FFC CONN. BASE | |
| | 2042329006 | 10P SAN-PH CONN. CORD | |
| **KU-5862 DIGITAL SIG. PRO. UNIT** | | | |
| IC1 | 2620736008 | CXD1125 | |
| IC2 | 2620673006 | HM6116FP/LFP-4/3/2 | |
| C3 | 2539036006 | CK45=1E104Z | |
| C4 | 2544254051 | CE04W1C221M(SME) | |

## DISPLAY UNIT (2U-1753)

| Ref. No. | Part No. | Part Name | Remarks |
|---|---|---|---|
| D201~208 | 2760049011 | 1S2076A | |
| | 2124699900 | TACT SWITCH | |
| | 3934061109 | FIP9BNM7A | (FL TUBE) |
| | 4990088002 | QH3031HO | |
| | 2050491010 | 31P FFC CONN. BASE | |

## POWER SUPPLY UNIT

### 2U-1754B (U.S.A./Canada)

| Ref. No. | Part No. | Part Name | Remarks |
|---|---|---|---|
| ⚠ | 2040223007 | 6P SAN-PH CORD | |
| ⚠ | 2538014003 | CK45F2GAC103M | 0.01μF 400V |
| ⚠ | 2124697009 | POWER SWITCH | |

### 2U-1754C (Europe)

| Ref. No. | Part No. | Part Name | Remarks |
|---|---|---|---|
| ⚠ | 2040223007 | 6P SAN-PM CORD | |
| ⚠ | 2538014003 | CK45F2GAC103M | 0.01μF 400V |
| | 4150299000 | CONDENSER COVER | |
| ⚠ | 2124697009 | POWER SWITCH | |

### 2U-1754D (Asia)

| Ref. No. | Part No. | Part Name | Remarks |
|---|---|---|---|
| ⚠ | 2040223007 | 6P SAN-PH CORD | |
| ⚠ | 2538014003 | CK45F2GAC103M | 0.01μF 400V |
| | 4150299000 | CONDENSER COVER | |
| ⚠ | 2124697009 | POWER SWITCH | |
| ⚠ | 2124698008 | VOLTAGE SELECTOR(D) | |

### 2U-1754E/F (Australia/U.K.)

| Ref. No. | Part No. | Part Name | Remarks |
|---|---|---|---|
| ⚠ | 2040223007 | 6P SAN-PH CORD | |
| ⚠ | 2538014003 | CK45F2GAC103M | 0.01μF 400V |
| | 4150299000 | CONDENSER COVER | |
| ⚠ | 2124697009 | POWER SWITCH | |

WARNING:
Parts marked with ⚠ and/or shading have special characteristics important to safety.
Be sure to use the specified parts for replacement.

## PARTS LIST OF EXPLODED VIEW

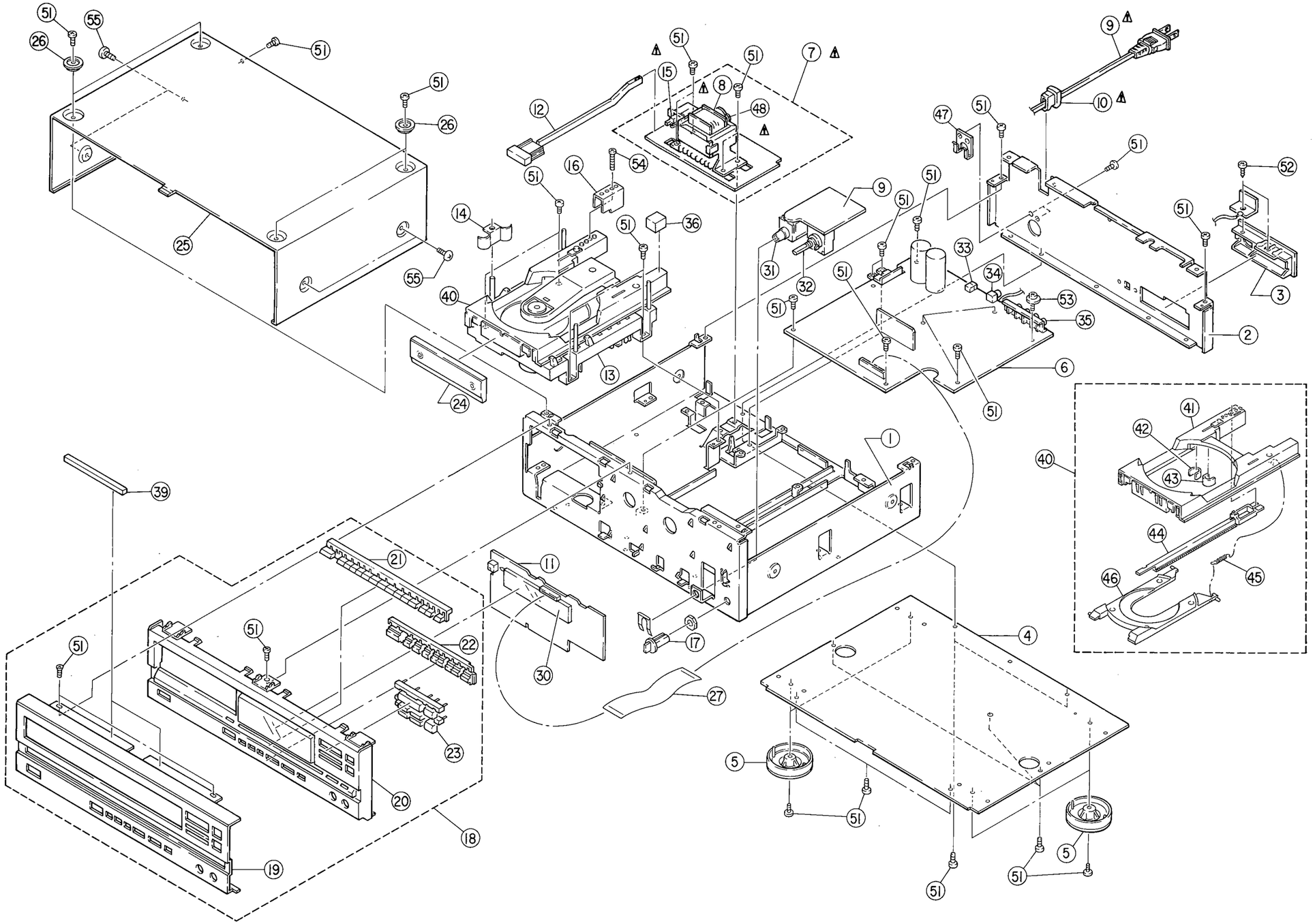
| Ref. No. | Part No. | Part Name | Remarks |
|---|---|---|---|
| 1 | 4110830205 | CHASSIS | |
| 2 | 1050813107 | BACK PANEL | Europe,U.K. Australia |
| 2 | 1050813123 | BACKPANEL | U.S.A. |
| 2 | 1050813136 | BACKPANEL | Canada |
| 2 | 1050813149 | BACKPANEL | Asia |
| 3 | 1031192106 | PIN JACK HOLDER | |
| 4 | 1050814300 | BOTTOM COVER | |
| 5 | 1040191004 | FOOT Ass'y | |
| 6 | 2U-1752B | SERVO & SIG UNIT | Europe,Asia, Australia,u.k. |
| 6 | 2U-1818A | SERVO & SIG UNIT | U.S.A.,Canada |
| ⚠ 7 | 2U-1754B | POWER SUPPLY UNIT | U.S.A.,Canada |
| ⚠ 7 | 2U-1754C | POWER SUPPLY UNIT | Europe |
| ⚠ 7 | 2U-1754D | POWER SUPPLY UNIT | Asia |
| ⚠ 7 | 2U-1754E | POWER SUPPLY UNIT | Australia |
| ⚠ 7 | 2U-1754F | POWER SUPPLY UNIT | U.K. |
| ⚠ 8 | 2335740004 | POWER TRANS | Europe,U.K., Australia |
| 8 | 2335741003 | POWER TRANS | U.S.A.,Canada |
| 8 | 2335742002 | POWER TRANS | Asia |
| ⚠ 9 | 2062002031 | AC CORD | Europe |
| 9 | 2062025005 | AC CORD | Australia |
| 9 | 2062061001 | AC CORD | U.S.A.,Canada |
| 9 | 2062024006 | AC CORD | U.K. |
| 9 | 2006031026 | AC CORD | Asia |
| 10 | 4450056008 | CORD BUSH | |
| 11 | 2U-1753 | DISPLAY UNIT | |
| 12 | 1131067209 | P. SW. LEVER Ass'y | |
| 13 | FG402 | CD MECHA UNIT | |
| 14 | 4630584002 | SPRING PLATE | |
| 15 | 2124697009 | POWER SWITCH | |
| 16 | GEN0199 | STOPPER P. SUB Ass'y | |
| 17 | 1120572103 | VR. KNOB | |
| 18 | GEN0380 | FRONT PANEL SUB Ass'y | Europe,Asia Australia,U.K. |
| 18 | GEN0381 | FRONT PANEL SUB Ass'y | U.S.A.,Canada |
| 19 | 1441811213 | FRONT PANEL | |
| 20 | 1461013402 | SUB PANEL Ass'y | Europe,Asia Australia,U.K. |
| 20 | 1461013415 | SUB PANEL Ass'y | U.S.A.,Canada |
| 21 | 1131157106 | TENKEY KNOB | |

| Ref. No. | Part No. | Part Name | Remarks |
|---|---|---|---|
| 22 | 1131070102 | KNOB SERIES | |
| 23 | 1131071305 | FUNCTION KNOB Ass'y | |
| 24 | 1460961005 | LOADER PANEL | |
| 25 | 1020371103 | TOP COVER | |
| 26 | 1460772003 | TOP COVER WASHER | |
| 27 | 0090011009 | 31P FFC | |
| 30 | 3930061109 | FIP9BNM7A | |
| 31 | 2048109013 | HEADPHONE JACK | |
| 32 | 2110568003 | V1620V20FB103M | |
| 33 | 2690084007 | GP1F3IT | |
| 34 | 2048256005 | 1P PIN JACK | |
| 35 | 2048261003 | 4P PIN JACK | |
| 36 | 4610346082 | SPACER RUBBER | |
| 37 | — | — | |
| 38 | — | — | |
| 39 | 1290131018 | ANTI-NOISE RUBBER | |
| 40 | GEN0198 | LOADER FRAME SUB Ass'y | |
| 41 | 4310264503 | LOADER FRAME | |
| 42 | 1220165009 | HIMERON SHEET | |
| 43 | 1220110070 | HIMERON SHEET | |
| 44 | 4350110303 | RACK | |
| 45 | 4630574009 | DISC TRAY SPRING | |
| 46 | 4310284004 | DISC TRAY Ass'y | |
| 47 | 4122744004 | V.HOLDER | Asia only |
| ⚠ 48 | 2124698008 | VOLTAGE SELECTOR (D) | Asia only |
| 51 | 4737002021 | 3×8 CBTS(S)-B | |
| 52 | 4737508017 | 3×10 CBTS(P)-B | |
| 53 | 4718010100 | SPECIAL SCREW | |
| 54 | 4733808009 | 3×25 CBTS(1) | |
| 55 | 4737018002 | 4×8 CTTS(S)-B | |
| ★ | 5130985003 | INST. LABEL | |
| ★ | 5131220000 | CAUTION LABEL | |
| ★ | 5131484008 | E2 RATING SHEET | Europe |
| ★ | 5158030008 | PRESET LABEL | Asia |
| ★ | 5150359004 | CAUTION SHEET | Asia |
| ★ | 5131491004 | RATING SHEET | Asia |
| ★ | 5131494001 | RATING SHEET | Australia,U.K. |
| ★ | 5131485007 | RATING SHEET | U.S.A.,Canada |
| ★ | 5130209019 | NOTICE SHEET | Australia |
| ★ | 5138266009 | DANGEROUS MARK | U.S.A.,Canada |
| ★ | 5131381004 | MANUFAC DATE LABEL | U.S.A.,Canada |

**NOTE FOR PARTS LIST**

- Part indicated with the mark "◉" are not always in stock and possibly to take a long period of time for supplying, or in some case supplying of part may be refused.
- When ordering of part, clearly indicate "1" and "I" (i) to avoid mis-supplying.
- Ordering part without stating its part number can not be supplied.
- Part indicated with the mark "★" is not illustrated in the exploded view.
- Not including Carbon Film ±5%, 1/6W, 1/4W Type in the P.W. Board parts list.
- ⚠ Means important safety item, which must be replaced when necessary, by a part specified or meeting the specification by the manufacturer.

EXPLODED VIEW



## PARTS LIST OF PACKING & ACCESSORIES

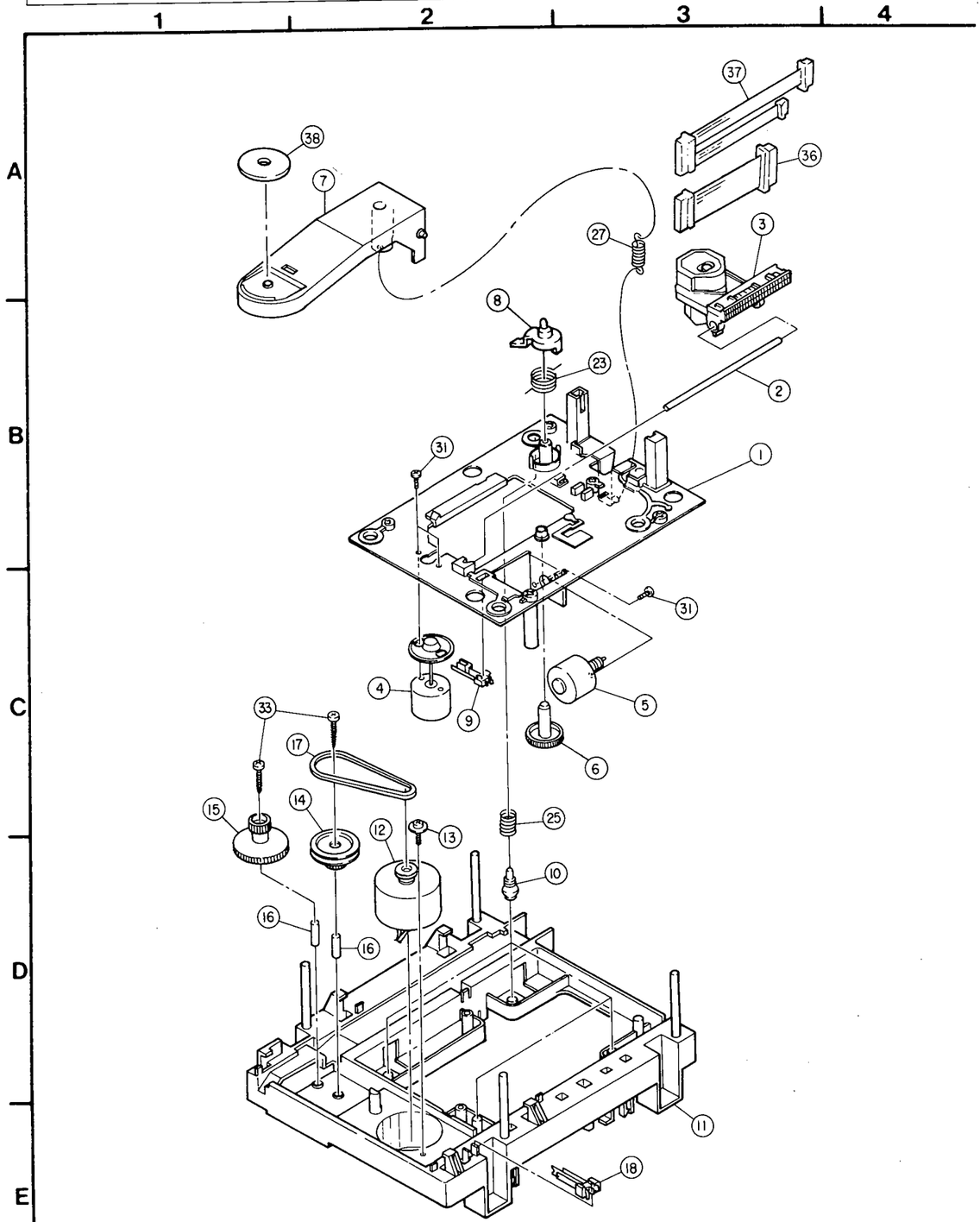
| Ref. No. | Part No. | Part Name | Remarks |
|---|---|---|---|
| | 5011322015 | CARTON CASE | |
| | 5030757108 | CUSHION Ass'y | |
| | 5050102092 | STYLEN PAPER | |
| | 5040092060 | STYLEN PAPER | |
| | 5050061007 | ENVELOPE | |
| | 5111798002 | INST.MANUAL(E2) | Europe,U.K., Asia,,Australia, Canada |
| | 5111802008 | SWEDISH INST. MANUAL | Europe,Asia, Canada |
| | 5111799001 | INST.MANUAL(EU) | U.S.A. only |
| | 2032223002 | 2P PIN CORD | |
| | 4990122007 | RC-217 | |
| | 5131338002 | CONTROL CARD BASE | |
| | 5131349004 | THERMAL CARBON FILM | |
| ⚠ | 2033667007 | PLUG ADAPTER | Asia only |
| | 5150388004 | DCI WARRANTY | Canada only |
| | 5150418107 | DAI WARRANTY HOME | U.S.A. only |
| | 5150439005 | SAFETY INSTRUCTION | U.S.A. only |

WARNING:
Parts marked with ⚠ and/or shading have special characteristics important to safety.
Be sure to use the specified parts for replacement.

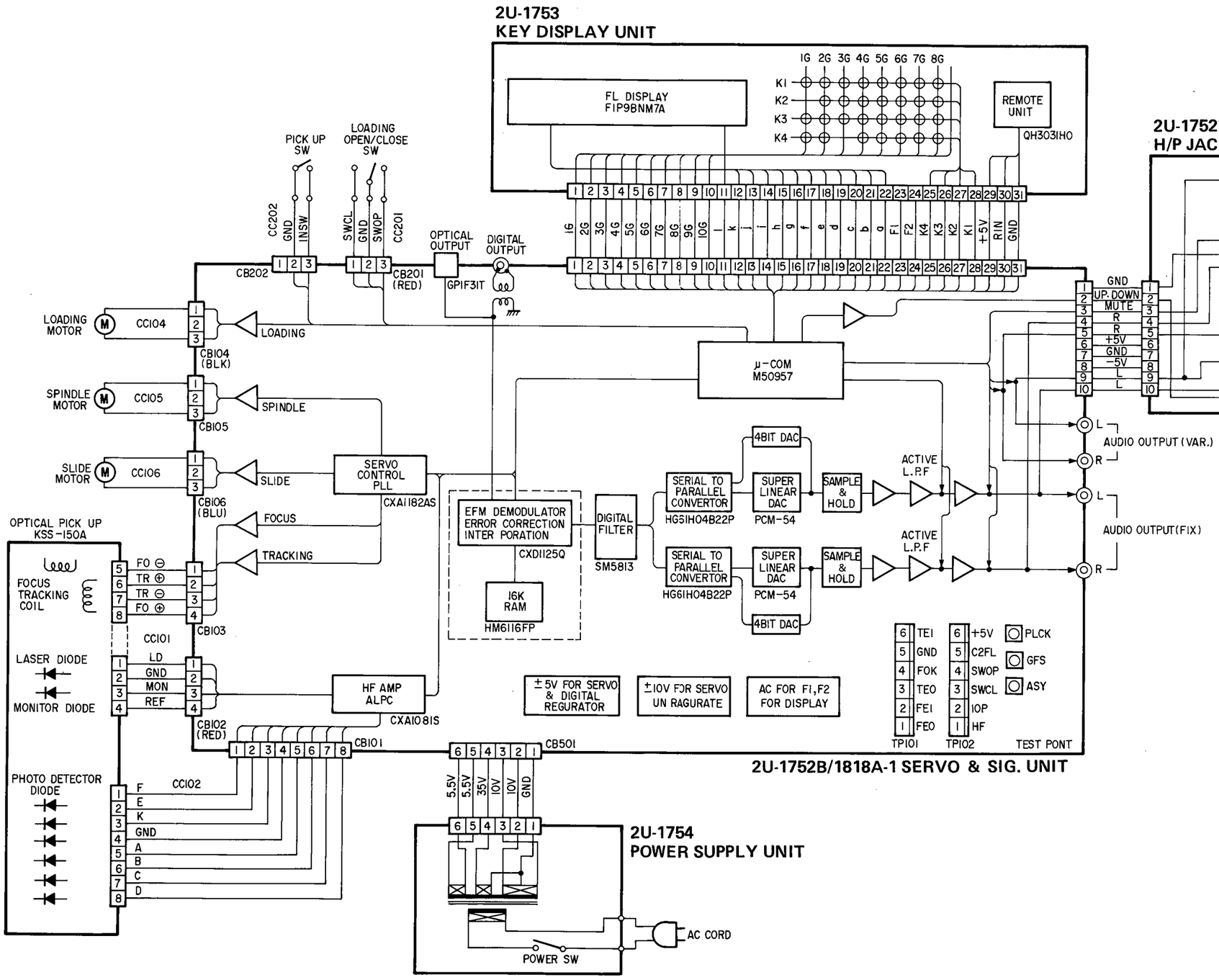
## EXPLODED VIEW OF FG-402 MECHANISM UNIT

| Ref. No. | Part No. | Part Name | Remarks |
|---|---|---|---|
| 1 | 4110783501 | PU MECHA.BASE | |
| 2 | 4310262000 | PU SLIDE SHAFT | |
| 3 | 4990100003 | LASER PU(KSS-150A) | |
| 4 | PS02A08 | SPINDLE M.SUB Ass'y | |
| 5 | PS02A09 | SLIDE M.SUB Ass'y | |
| 6 | 4240127008 | HELICAL GEAR | |
| 7 | 4330505200 | CLAMP ARM Ass'y | |
| 8 | 4240129200 | CLAMP CAM | |
| 9 | 2124696000 | LEAF SW(PU) | |
| 10 | 4620078104 | DAMPER | |
| 11 | 4110789408 | MECHA. BASE | |
| 12 | PLD1A49 | LOADING M. SUB Ass'y | |
| 13 | 4770262006 | SPECIAL SCREW | |
| 14 | 4240130008 | PULLEY GEAR | |
| 15 | 4240131007 | GEAR | |
| 16 | 4430799000 | COLLAR | |
| 17 | 4230050004 | BELT | |
| 18 | 2124613009 | LEAF SW(O/C) | |
| 19 | – | – | |
| 20 | – | – | |
| 21 | – | – | |
| 22 | – | – | |
| 23 | 4630585001 | C.L.C. SPRING | |
| 24 | – | – | |
| 25 | 4630583100 | SPRING(F) | |
| 26 | – | – | |
| 27 | 4630573000 | CLAMPER SPRING | |
| 28 | – | – | |
| 29 | – | – | |
| 30 | – | – | |
| 31 | 4713801039 | 2×3 CBS-Z | |
| 32 | – | – | |
| 33 | 4733808009 | 3×25 CBTS(1) | |
| 34 | – | – | |
| 35 | – | – | |
| 36 | 2042159069 | 8P PH CONNE WIRE | |
| 37 | 2042282004 | 8P-4P,4P PH CORD | |
| 38 | 4610448003 | DAMP SHEET | |

## PARTS LIST OF FG-402 MECHANISM UNIT

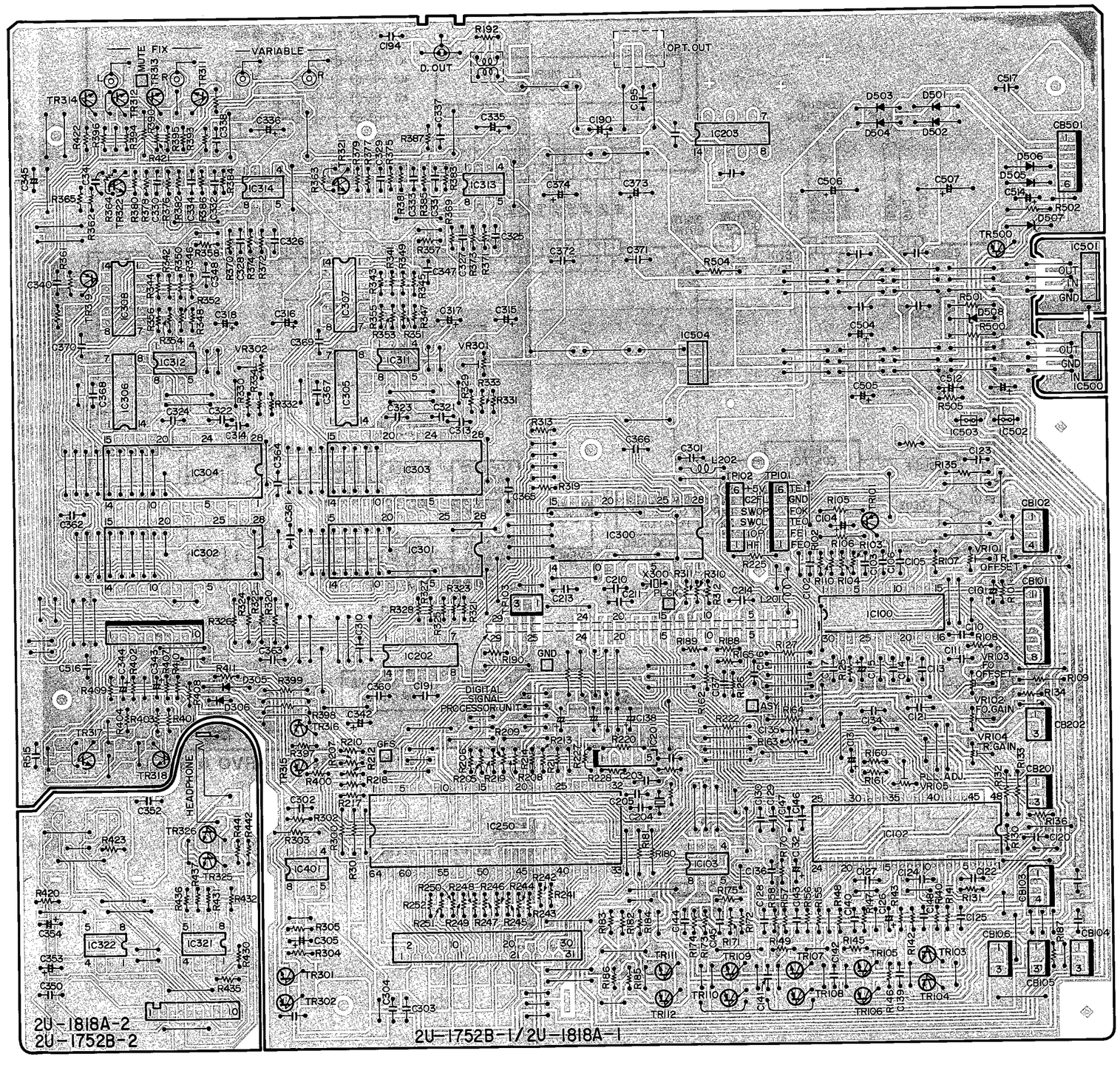


## WIRING DIAGRAM

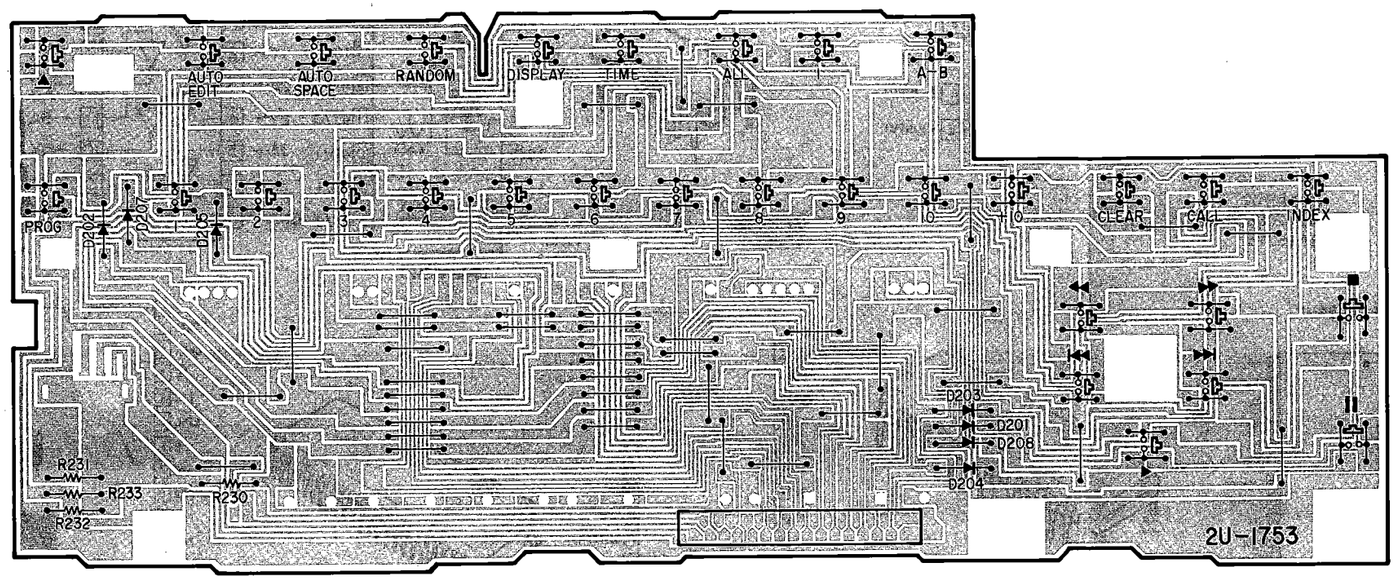


P.W. BOARD

## 2U-1752B/1818A SERVO & SIGNAL UNIT

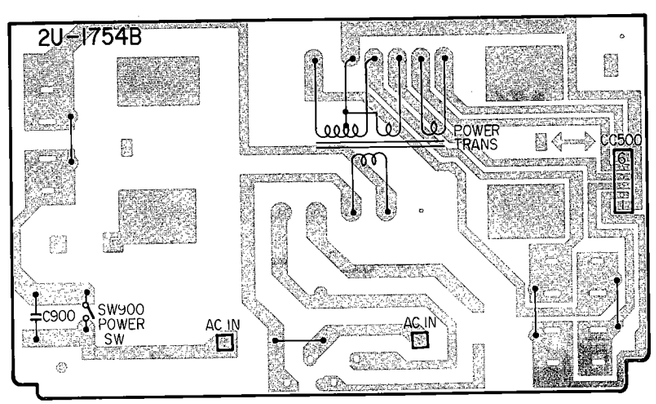

MUTE FIX
VARIABLE
L
R
TR313
TR312
TR311
TR314
D. OUT
OPT. OUT
R192
C194
C195
C190
IC203
C517
D503
D501
D504
D502
CB501
D506
D505
C514
R502
D507
C506
C507
TR500
IC501
OUT
IN
GND
R501
D508
R500
IC500
C504
C505
C512
R505
IC503
IC502
IC504
C373
C374
C372
C371
R504
C325
C326
C315
C317
C316
C318
C347
C369
VR302
VR301
IC307
IC312
IC311
IC306
IC305
IC304
IC303
IC302
IC301
C324
C322
C323
C321
C313
C314
C364
C362
C361
C366
C301
L202
R313
R319
TR102
TR101
IC300
R225
R135
C123
CB102
R105
R101
C104
R106
R103
C103
C105
R107
VR101
TR OFFSET
R110
R104
C102
C101
CB101
IC100
C214
C213
C211
C210
X300
PLCK
R311
R310
R312
C201
R323
R324
R325
R326
R327
R328
C310
C311
IC202
C516
C344
R402
R403
R404
R411
D305
D306
R399
R409
R408
R410
C360
C191
DIGITAL SIGNAL PROCESSOR UNIT
R398
TR316
TR317
TR315
R400
R401
R515
R210
R218
R217
R209
R213
R206
R205
R219
R208
R207
R214
R215
R216
R211
R212
R220
R228
R203
C138
C205
C204
R222
C137
C136
C135
C134
C133
C132
C131
C130
C129
C147
C146
C145
C144
C143
C142
C141
C140
C139
C128
C127
C126
C125
C124
C123
C122
C121
C120
R222
R163
R164
R160
R161
VR105
PLL ADJ
VR104
R.GAIN
VR103
F0 OFFSET
VR102
FO.GAIN
R134
R133
R132
R136
CB202
CB201
CB203
CB104
CB105
CB106
CB107
R187
R186
R185
R184
R183
R182
R181
R180
R175
R174
R173
R172
R171
R170
R169
R168
R167
R166
R165
R162
R159
R158
R157
R156
R155
R154
R153
R152
R151
R150
R149
R148
R147
R146
R145
R144
R143
R142
R141
R140
R139
R138
R137
R131
R130
R129
R128
R127
R126
R125
R124
R123
R122
R121
R120
R119
R118
R117
R116
R115
R114
R113
R112
R111
R110
R109
R108
R107
R106
R105
R104
R103
R102
R101
TR112
TR111
TR110
TR109
TR108
TR107
TR106
TR105
TR104
TR103
R253
R252
R251
R250
R249
R248
R247
R246
R245
R244
R243
R242
R241
R240
R239
R238
R237
R236
R235
R234
R233
R232
R231
R230
R229
R227
R226
R224
R223
R221
R218
R217
R216
R215
R214
R213
R212
R211
R210
R209
R208
R207
R206
R205
R204
R203
R202
R201
R200
R199
R198
R197
R196
R195
R194
R193
R192
R191
R190
R189
R188
R187
R186
R185
R184
R183
R182
R181
R180
R179
R178
R177
R176
R175
R174
R173
R172
R171
R170
R169
R168
R167
R166
R165
R164
R163
R162
R161
R160
R159
R158
R157
R156
R155
R154
R153
R152
R151
R150
R149
R148
R147
R146
R145
R144
R143
R142
R141
R140
R139
R138
R137
R136
R135
R134
R133
R132
R131
R130
R129
R128
R127
R126
R125
R124
R123
R122
R121
R120
R119
R118
R117
R116
R115
R114
R113
R112
R111
R110
R109
R108
R107
R106
R105
R104
R103
R102
R101
R100
R99
R98
R97
R96
R95
R94
R93
R92
R91
R90
R89
R88
R87
R86
R85
R84
R83
R82
R81
R80
R79
R78
R77
R76
R75
R74
R73
R72
R71
R70
R69
R68
R67
R66
R65
R64
R63
R62
R61
R60
R59
R58
R57
R56
R55
R54
R53
R52
R51
R50
R49
R48
R47
R46
R45
R44
R43
R42
R41
R40
R39
R38
R37
R36
R35
R34
R33
R32
R31
R30
R29
R28
R27
R26
R25
R24
R23
R22
R21
R20
R19
R18
R17
R16
R15
R14
R13
R12
R11
R10
R9
R8
R7
R6
R5
R4
R3
R2
R1
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
C13
C14
C15
C16
C17
C18
C19
C20
C21
C22
C23
C24
C25
C26
C27
C28
C29
C30
C31
C32
C33
C34
C35
C36
C37
C38
C39
C40

## 2U-1753 DISPLAY UNIT

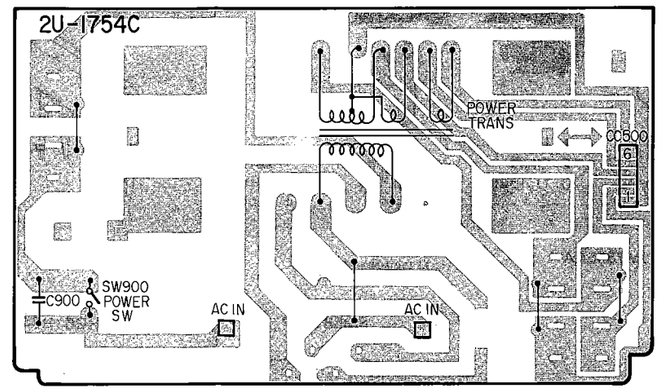



## POWER SUPPLY UNIT

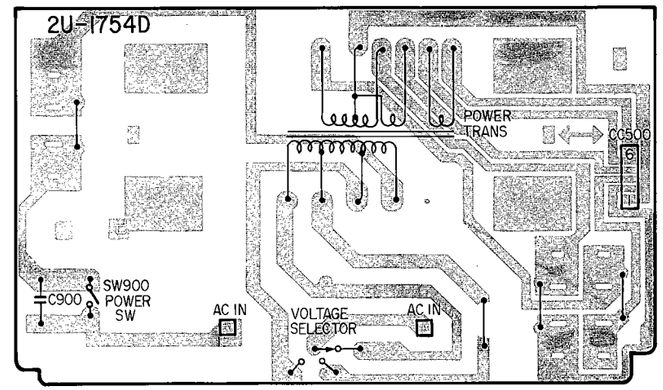
### 2U-1754B (U.S.A./Canada)



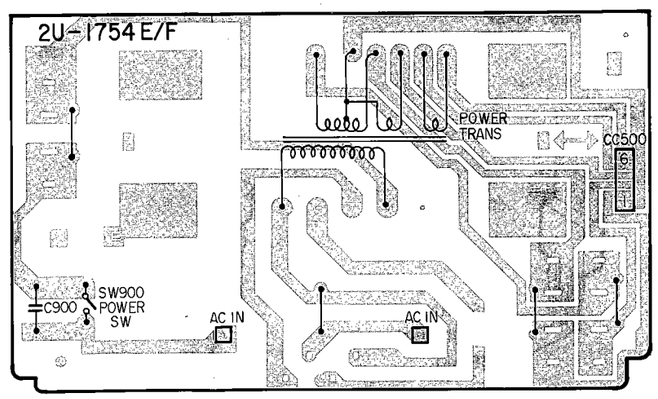

### 2U-1754C (Europe)




### 2U-1754D (Asia)

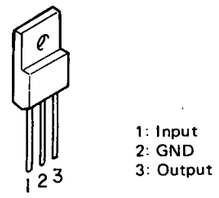



### 2U-1754E/F (Australia/U.K.)



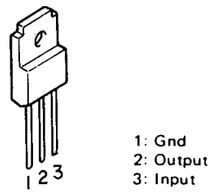
## SEMICONDUCTORS

### ●IC



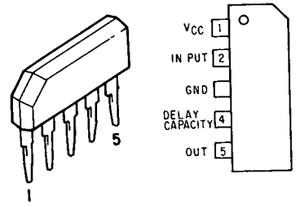

1: Input
2: GND
3: Output

NJM7805FA

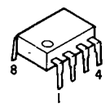



1: Gnd
2: Output
3: Input

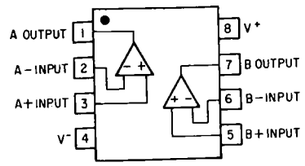
NJM79M05FA



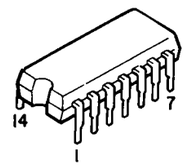

M51953B



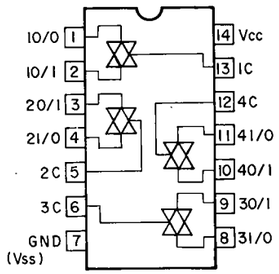

NJM4556D
μPC4570C
NJM2068DAC
BA15218




TC74HC4066

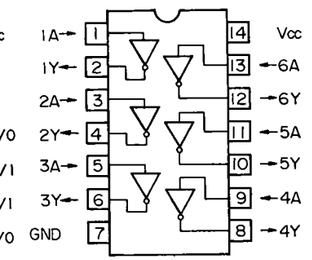



TC74HC4066
HD74HC04P

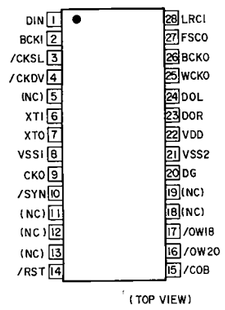



(TOP VIEW)

HD74HC04P

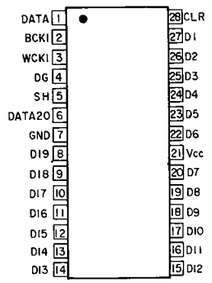



SM5813AP

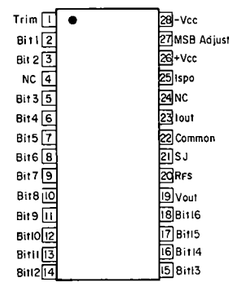



(TOP VIEW)

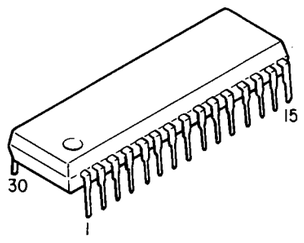
HG61H04B22P



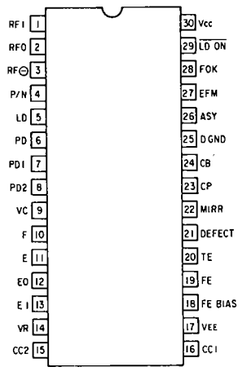

PCM-54HP

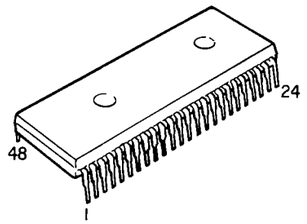



SM5813AP
HG61H04B22P
PCM-54HP

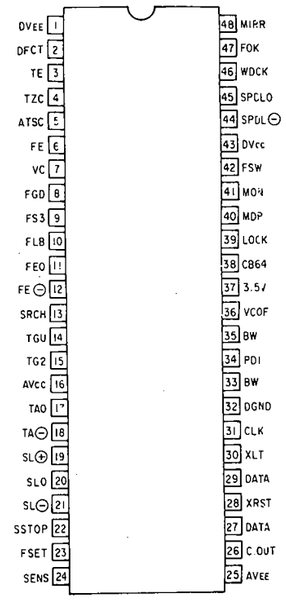


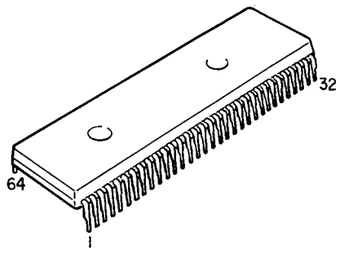

CXA1081S



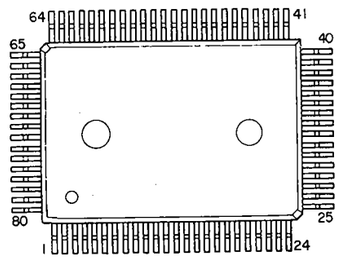




CXA1182AS



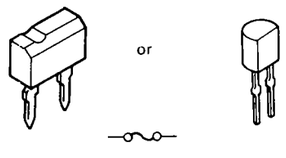




M50957-134SP



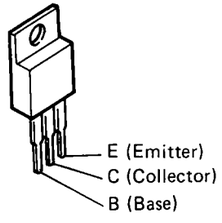

CXD1125

### ●ICプロテクター




ICP-F15

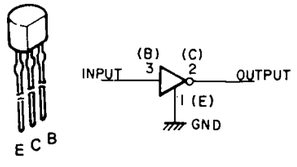
### ●トランジスター




2SB1274
2SD1913

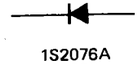
2SA933(Q)
2SD1504(E/F)

2SB562
2SD468(C)




RN1202(10K-10K)NPN
RN2202(10K-10K)PNP

### ●ダイオード



1S2076A
1S2076
1SR35-200

HZ7C-2
HZ33L-3

SCHEMATIC DIAGRAM

1 2 3 4 5 6 7 8 9 10

A B C D E F G H

KU-5862 DIGITAL SIG. PRO UNIT

2U-1752B/1818A SERVO SIG. PRO UNIT

2U-1753 DISPLAY UNIT

2U-1754B POWER SUPPLY UNIT

2U-1752B-2/1818A-2 H/P JACK UNIT

U.S.A., Canada Models

Europe Models

Australia, U.K. Models

Asia Models

2U-1754C

2U-1754E/F

2U-1754D

SIGNAL LINE

+B LINE

-B LINE

NOTES
ALL RESISTANCE VALUES IN OHM k = 1,000 OHM M = 1,000,000 OHM
ALL CAPACITANCE VALUES IN MICRO FARAD P = MICRO-MICRO FARAD
EACH VOLTAGE AND CURRENT ARE MEASURED AT NO SIGNAL INPUT CONDITION.
CIRCUIT AND PARTS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.

**WARNING:**
Parts marked with this symbol ⚠ ▨ have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer.

**CAUTION:**
Before returning the unit to the customer, make sure you make either (1) a leakage current check or (2) a line to chassis resistance check. If the leakage current exceeds 0.5 milliamps, or if the resistance from chassis to either side of the power cord is less than 240 k ohms, the unit is defective.

**WARNING:**
DO NOT return the unit to the customer until the problem is located and corrected.